

ISO 15926 and Semantic Technologies

Alois Pichler

The Wittgenstein Archives: From Manuscripts to Semantic Web Representations

I would like to thank the participants for valuable comments.

The Wittgenstein Archives at the University of Bergen (WAB, 1990-)

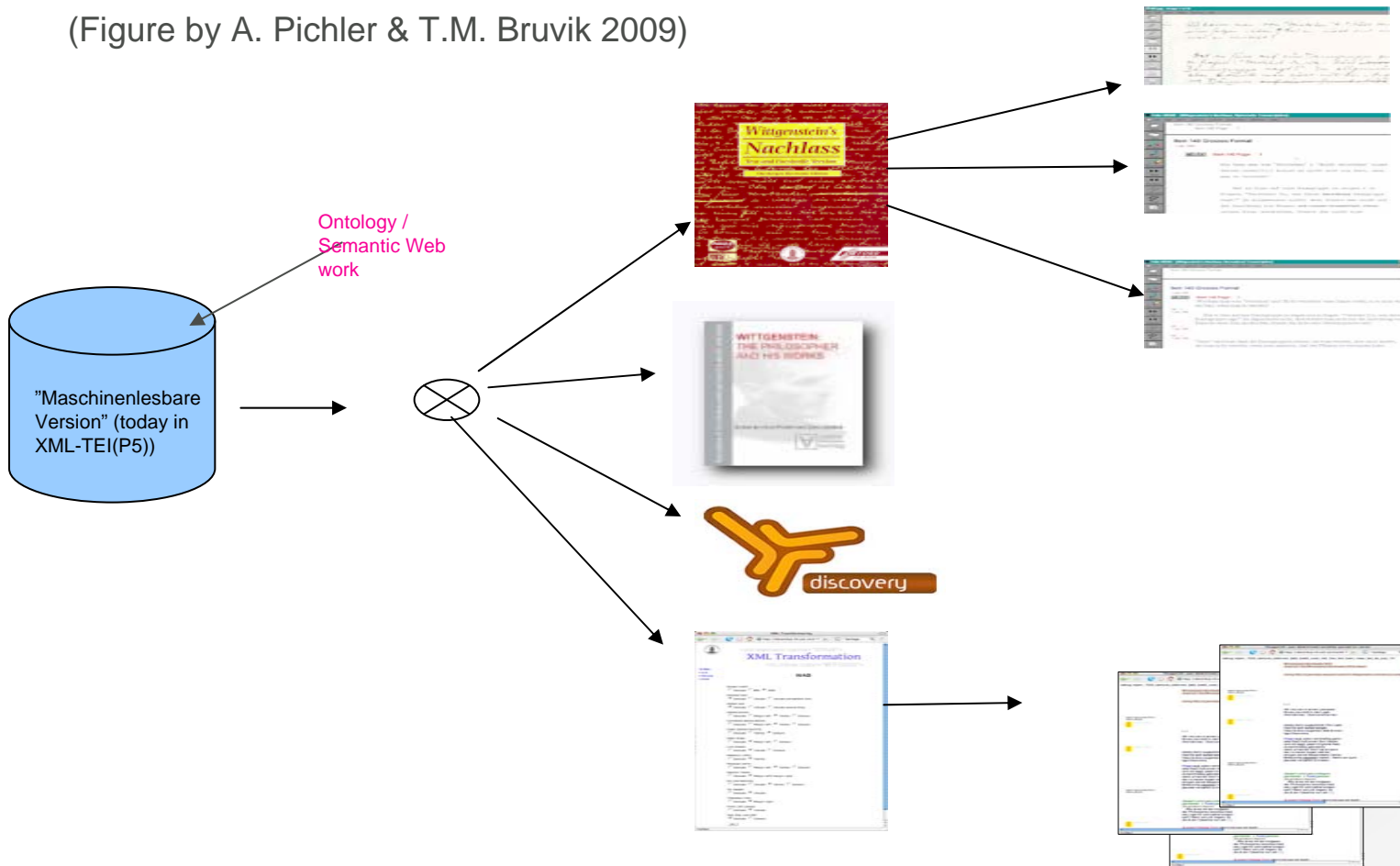
- Produced from 1990 to 1999 a "machine-readable version" of Wittgenstein's Nachlass
- Published in 2000, on the basis of the machine-readable version, at OUP "Wittgenstein's Nachlass: The Bergen Electronic Edition" (BEE)
- Has migrated the machine-readable version from MECS-WIT to XML-TEI(P5) markup language
- Has made 5000 pages of the Wittgenstein Nachlass OA available on the Web (<http://www.wittgensteinsource.org/>)
- Works towards a new BEE
- Has begun, in the frame of the EU funded DISCOVERY project, to apply Semantic Web thinking and technology to Wittgenstein's Nachlass
 - Ontology Web Language (OWL)
 - Ontology editor *Protegé*
 - Ontology browser/navigator/visualizer *Philospace/SwickyNotes*

From manuscripts to Semantic Web representations

The image illustrates the transition from a physical manuscript to a digital semantic web representation. On the left, a handwritten manuscript page is shown, featuring the title "Philosophische Untersuchungen. Versuch einer Klarifizierung." and the author's name "Augustinus". The text discusses the nature of language and the concept of "Schach" (chess). On the right, a screenshot of the "Philospace V2.1.3" web application is displayed. The browser window shows the URL "http://www.wittgenstein-source.org/texts/BTE/Ms-114.42[6]" and the page content, which includes a search bar, a list of manuscript fragments, and a contextual graph. The graph shows a network of nodes representing different manuscript fragments, connected by red lines indicating semantic relationships. The browser also shows an ontologies panel with a tree structure of entities like "Philospace user", "Aristoteles", and "Augustinus_Aurelius".

WAB's "machine-readable version" and products from it

(Figure by A. Pichler & T.M. Bruvik 2009)



MECS-WIT -> XML-TEI(P5)

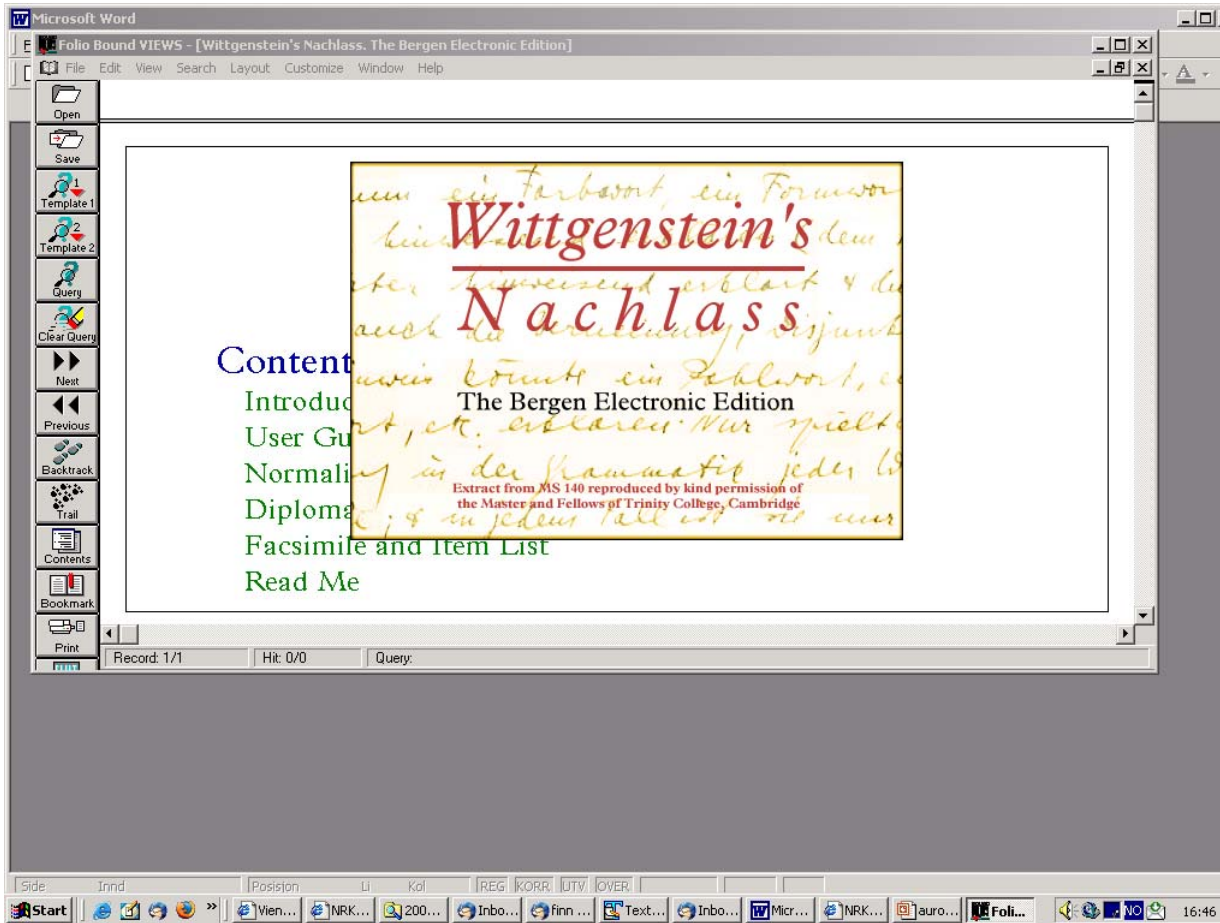
```
<R/330/R><sec/<indl/3/indl>
```

```
<s/[s/2|Das Lernen der menschlichen Sprache be{hypl}schreibt  
[person/2\Augustinus/person| Augustinus, Aurelius/person]  
so{colon}/s| <i/[person/2\Augustinus/person| Augustinus,  
Aurelius/person| beschreibt das Lernen [pma/2{\sp/pma}/pma] der  
menschlichen Sprache/pma] so{colon}/i>/s]  
<latin/{lp}[extref/2\Confessiones I{p/ordinal}8{rp}<hl>  
<q/{udq/sudq}{sp/sss} cum {sp/sms} appellabant rem aliquam et  
cum secun{hypl}dum eam vocem corpus ad aliquid movebant,  
videbam et tenebam hoc ab eis vocari rem illam, quod sonabant,  
cum eam vellent ostendere{udq/eudq}/q>/extref| Augustinus,  
Aurelius; Confessiones 1,8/extref]{p/es}/latin/>s> /sec>
```

```
<ab n="Ms-115,118[2]" ana="date_19360800-19361100"  
rend="blbef_0 blaft_0">
```

```
<s type="es" rend="indl_3"><choice type="s"><orig  
type="alt1">Das Lernen der menschlichen Sprache be<lb  
rend="shyphen"/>schreibt <persName key="Augustinus, Aurelius"  
corresp="commentary">Augustinus</persName> so&colon;</orig>  
<orig type="alt2"> <add rend="i"><persName key="Augustinus,  
Aurelius" corresp="commentary">Augustinus</persName>  
beschreibt das Lernen <corr type="pma"><orig  
type="pma1">&sp.pma;</orig> <reg type="pma2"> der  
menschlichen Sprache</reg></corr>  
so&colon;</add></orig></choice> <seg xml:lang="latin">&lp;<rs  
type="extref" key="Augustinus, Aurelius; Confessiones 1, 8"  
corresp="commentary">Confessiones I&p.ordinal;8&rp;<lb  
rend="hl"/> <!--quote start-->&udq.sudq;&sp.sss; cum &sp.sms;  
appellabant rem aliquam et cum secun<lb rend="shyphen"/>dum  
eam vocem corpus ad aliquid movebant,<lb/> videbam et tenebam  
hoc ab eis vocari rem illam,<lb/> quod sonabant, cum eam  
vellent ostendere&udq.eudq;<!--quote end --  
></rs>&p.es;</seg></s> <lb rend="hl"/></ab>
```

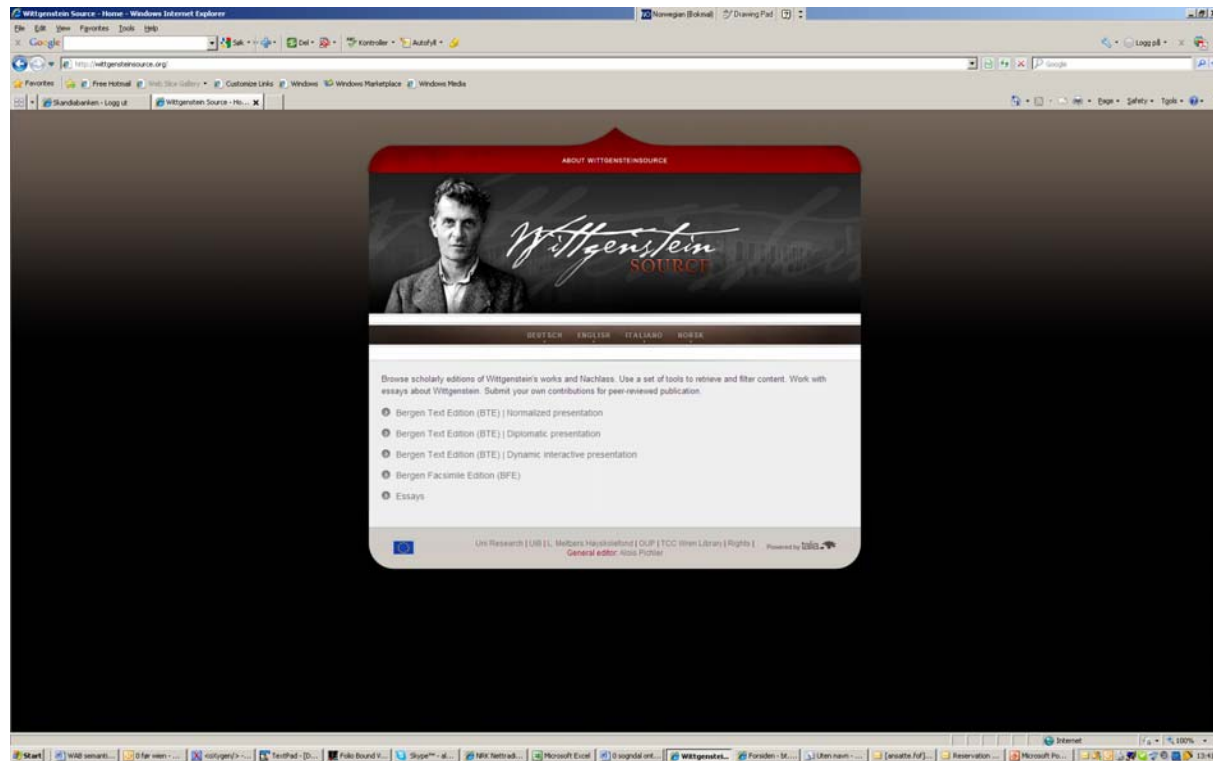
Bergen Electronic Edition (BEE, OUP 2000)



Semantic Web elements already in BEE

- "Fields"
- "Groups"
 - Mathematics taxonomy
 - Graphics taxonomy
- "Shadow file"
 - Personal notebook function

Wittgenstein Source



Interactive dynamic editing: Interactive dynamic presentation (IDP)

The screenshot shows a Mozilla Firefox browser window with the URL `http://wab.aksis.uib.no/transform/wab.php?modus=opsjoner`. The page title is "XML Transformation: Interactive Dynamic Presentation of the Wittgenstein Nachlass". The browser's address bar shows "Norwegian (Bokmal)".

The page content includes logos for the University of Bergen, MelTZERS HOGSKOLEND, uni Research, and COST. Below the logos, the text reads:

```
<xsl:element name="SPAN">  
XML Transformation  
<fo:inline color="#FF0000">
```

The main heading is "Wittgenstein Archives at the University of Bergen (WAB): Interactive Dynamic Presentation of the Wittgenstein Nachlass".

A paragraph of text states: "With this [interactive site](#), users can filter and present WAB's transcriptions of 5000 pages of the Wittgenstein Nachlass according to own research needs, and thus prepare Nachlass editions which may be more suited for their research than the editorial outputs, pre-produced by WAB. This is still a draft version, and the range of filter options will be extended. For questions and comments write to [Alois Pichler](#)."

The interface features a section titled "Select a Nachlass item:" with a dropdown menu showing "Ms-114". Below this is a table of filter options:

Basic style	<input checked="" type="radio"/> Diplomatic	<input type="radio"/> Normalized
Additions	<input checked="" type="radio"/> Diplomatic	<input type="radio"/> Normalized
Overwritings	<input checked="" type="radio"/> Diplomatic	<input type="radio"/> Normalized
Deletions	<input checked="" type="radio"/> Diplomatic	<input type="radio"/> Normalized
Deletions, deleted part does not fit in context	<input checked="" type="radio"/> Diplomatic	<input type="radio"/> Normalized
Editorial corrections	<input checked="" type="radio"/> Diplomatic	<input type="radio"/> Normalized
Line breaks	<input checked="" type="radio"/> Include	<input type="radio"/> Exclude
Revisions in different writing medium, incl. handwritten revisions in typescript	<input checked="" type="radio"/> Show	<input type="radio"/> Hide
Show or hide "section marks"	<input type="radio"/> Show	<input checked="" type="radio"/> Hide
Mark/do not mark	<input type="radio"/> Mark	<input checked="" type="radio"/> Do not mark
Code	<input type="radio"/> Mark	<input checked="" type="radio"/> Do not mark
Dedication	<input type="radio"/> Mark	<input checked="" type="radio"/> Do not mark

The browser's taskbar at the bottom shows various open applications, including Microsoft Outlook, TextPad, NRK Netradio, and the current XML Transformation application.

The Wittgenstein Source domain

Classes	Subclasses			'Instances' (some examples)
Source	Primary source	External source		<ul style="list-style-type: none"> • Augustinus, Aurelius: Confessiones • Shakespeare, William: King Lear
		Wittgenstein source	Bemerkung	<ul style="list-style-type: none"> • Ms-152,39[1] • Ts-220,15[4]et16[1]et17[1]
			MS	<ul style="list-style-type: none"> • Ms-152 • Ms-301
			TS	<ul style="list-style-type: none"> • Ts-220 • Ts-310
			"Work"	<ul style="list-style-type: none"> • PU • PG
	Secondary source			<ul style="list-style-type: none"> • Johannessen, K. S.: The Concept of Practice in Wittgenstein's Later Philosophy (1988) • Krüger, H.W.: Die Entstehung des Big Typescript (1993)
Subject	Philosophical concept	Philosophical topic	Topics in W's own phrasing	<ul style="list-style-type: none"> • Ts-213 Verstehen • Ts-213 Bedeutung
			Topics in WAB's phrasing	<ul style="list-style-type: none"> • Unsinn • Bild
		Philosophical point	Points in W's own phrasing	<ul style="list-style-type: none"> • Ts-213-001 Das Verstehen, die Meinung, fällt aus unsrer Betrachtung heraus
			Points in WAB's phrasing	<ul style="list-style-type: none"> • Die Frage nach der Verbindung zwischen Gedanke und Wirklichkeit aufgrund von Aehnlichkeit
	Event			
	Place			
	...			
Person				<ul style="list-style-type: none"> • Augustinus, Aurelius • Kant, Immanuel

Examples of *classes* and *sub-classes*

- WittgensteinSource: Class of Wittgenstein primary sources
 - MS: Subclass with instances: MS items
 - TS: Subclass with instances: TS items
 - Bemerkung: Subclass with instances: the single *Bemerkungen*
- PhilosophicalSubject: Class of philosophical topics, discussed in WittgensteinSource. 'Instances': Philosophical topics
 - Ts-213-Headings_Subject: Subclass with 'instances': Wittgenstein's own phrasings of philosophical topics in Ts-213 (Ts-213 content table chapter headings)
 - Ts-213-Subheadings_Subject: Subclass with 'instances': Wittgenstein's own descriptions of the philosophical points of Ts-213 (Ts-213 content table subchapter headings)
 - SemanticEnrichment: Subclass with 'instances': Short descriptions of the philosophical point of a Bemerkung

Examples of *properties*

- discovery:IsPartOf
 - discovery:hasCopy
 - discovery:hasDifferentVersion
 - discovery:hasSubject
 - discovery:refersExplicitlyToPerson
 - discovery:refersToSource
 - discovery:has Author
-
- IsPartOfWhole
 - IsComplementaryTo
 - HasPoint
 - HasDate
-
- discovery:xy properties are properties employed across all domains in the Discovery consortium

And that's what our OWL file looks like

```
<Bemerkung rdf:about="http://discovery-
  project.eu/ontologies/wittgensteinsource/Ts-213_3r-1">
<rdfs:comment
  rdf:datatype="http://www.w3.org/2001/XMLSchema#string">Ts-
  213,3r[1]</rdfs:comment>
<hasPoint rdf:resource="http://discovery-
  project.eu/ontologies/wittgensteinsource/Ts-213-
  001_Das_Verstehen_die_Meinung_faellt_aus_unsrer_Betrachtun
  g_heraus"/>
<discovery:hasSubject rdf:resource="http://discovery-
  project.eu/ontologies/wittgensteinsource/Ts-213_Verstehen"/>
<discovery:hasAuthor rdf:resource="http://discovery-
  project.eu/ontologies/wittgensteinsource/Wittgenstein_Ludwig"/>
...
</Bemerkung>
```


Some of our experiences with ontology work

- Positive perspectives
 - Users can enjoy content based and "criss-crossed" searching and browsing of Wittgenstein's works
 - Users receive a multilingual entrance key to the Wittgenstein Nachlass
 - Users receive genetic paths through the Wittgenstein Nachlass
 - Through ontologies, users can document, explicate, "reason" and share their different (and partly competing) interpretational approaches to Wittgenstein
- Challenges
 - Software (Oxygen, Protegé, Philospace/SwickyNotes; XML, OWL, RDF)
 - Prepare all ontology data (other than Philosophical concept data, see Table on Wittgenstein Source domain), in the XML transcription and extract them from there?
 - Implement a standoff collaborative Web-based annotation tool for Philosophical concept data?
 - Implement an interactive dynamic presentation and filtering tool for user defined ontology browsing?
 - Societal (e.g.: "Any ontology for Wittgenstein is a 'Procrustes bed'")
 - Conceptual and methodological

Conceptual and methodological challenges

- We have to do with a highly dynamic domain:
 - In Wittgenstein, concepts and their relations are constantly discussed and developed further
 - In Wittgenstein scholarship, understandings of Wittgenstein's concepts and their relationships can differ widely and even contradict each other
- We have to do with a wide range of different relation types, i.a.:
 - Hyponymy: Set-Element (Game-Chess)
 - Meronymy: Whole-Part (Syllogism-Premiss)
 - Antonymy & Complementarity (Realism-Antirealism, Knowing-Doubting, Inner-Outer ...)
- Bottom-up or Top-down approach?
- Hierarchical organization?
- Inheritance of properties?

Protegé

The screenshot displays the Protegé 3.4.4 interface for editing an OWL ontology. The window title is "wittgenstein_0.7 Protégé 3.4.4 (file:IC:\cost-a32_komm\wittgenstein_0.7.pprj, OWL / RDF Files)".

Class Browser: Shows a hierarchy for the project "wittgenstein_0.7". The root is "owl:Thing", followed by "scho:PhysicalObject", "scho:Source", "scho:PrimarySource", "WittgensteinExternalSource (10)", "WittgensteinSource", "Bemerkung (9610)", "Chapter (19)", "MS (14)", "TS (6)", "scho:SecondarySource", "scho:Subject", "scho:Concept", "PhilosophicalSubject (127)", "TS213ContentTableHeadings (19)", "SemanticEnrichment (131)", "TS213ContentTableSubheadings (1)", "scho:Event", "scho:FictionalEntity", "scho:Person (103)", "scho:PhysicalObject", and "scho:Place".

Instance Browser: Shows instances for the class "TS213ContentTableSubheadings". It lists 21 instances, with "Ts-213-010_Die_Bedeutung_eines_Zeichens_ist_durch_seine_Wirkung_die_Assoziationen_d..." selected.

Individual Editor: Shows the editor for the selected instance. It includes a table of properties and values:

Property	Value	Lang
rdfs:comment		
rdfs:label	Ts-213-010 "Die Bedeutung eines Zeichens ist durch seine Wirkung (die Assoziationen, die es auslöst, etc.) gegeben."	de
rdfs:label	Ts-213-010 "The meaning of a sign is given through its effect (the associations that it evokes, etc.)."	en

Below the table are sections for "scho:isCommentedBy", "scho:isExplainedIn", and "scho:isDefinedBy", each with a text area for input.

The Windows taskbar at the bottom shows the "start" button, open applications (Internet Explorer, Microsoft PowerPoint, Sogndal10, Microsoft Word, Protege.exe, wittgenstein...), and system tray icons (Google, NO, 10:52 AM).

Protegé

The screenshot displays the Protegé 3.4.4 interface with the following components:

- CLASS BROWSER:** Shows a class hierarchy for the project 'wittgenstein_0.7'. The selected class is 'Bemerkung' (9610) under the 'WittgensteinSource' class.
- INSTANCE BROWSER:** Shows asserted instances for the class 'Bemerkung', including 'Ms-139a_2r-2'.
- INDIVIDUAL EDITOR for Ms-139a_2r-2 (instance of Bemerkung):** Shows the individual's URI and a table of properties and values. The 'rdfs:comment' property is set to 'Ms-139a_2r[2]'. Other properties like 'hasTextualContent', 'refersExplicitlyToPer...', 'scho:hasSimilarContent', 'definesPhilosophical...', 'refersToSource', 'scho:hasSubject', 'hasCopy', 'scho:comments', 'scho:isPartOf', 'hasDifferentVersion', 'scho:defines', and 'scho:isRelatedTo' are also visible.

The Windows taskbar at the bottom shows the Start button, Internet Explorer, Microsoft PowerPoint, and other open applications.

Philospace

The screenshot shows the Philospace web application running in a browser window. The main content area features the Philospace logo (powered by SWickyNotes and DBin) and a section titled "Browse the Philospace Federation:" which displays a grid of source cards for various philosophical figures and topics, including Nietzsche, Wittgenstein, Pre-Socratic, Socratic Religion, Modern Philosophy, and Doxones Laertes. A sidebar on the right shows "Relations involving Philospace starting page" with a single node labeled "Philospace starting page". Below the sidebar is an "Ontologies" panel listing various users and entities. The Windows taskbar at the bottom shows the system tray with the time 9:05 AM and the start button.

Philospace

The screenshot displays the Philospace V2.1.3 (MurucaSKA) application window. The interface is divided into several panes:

- Browser:** Shows the URL [http://www.wittgensteinsource.org/texts/BTE/Ts-213,290r\[5\]](http://www.wittgensteinsource.org/texts/BTE/Ts-213,290r[5]). The page header includes a portrait of Ludwig Wittgenstein and the text "Wittgenstein SOURCE BERGEN TEXT EDITION (BTE) | NORMALIZED PRESENTATION". The breadcrumb trail is "Home > BTE > Ts-213_Big_TypeScript > Ts-213,290r[5]".
- Text Editor:** Contains two paragraphs of text:

"Diese Figur des Bildes bin ich" ist ein Uebereinkommen.

Ja, aber worin kommen wir überein? Welche Beziehung zwischen Zeichen, die etwa durch das Zeigen mit der Hand oder das Umhängen eines Tars nur durch das System bedeutungsvoll, dem sie angehört.
- Contextual Graph:** A network diagram titled "Relations involving Ts-213,290r[5]". The central node is "Ts-213,290r[5]". It is connected to several other nodes via labeled relationships:
 - WAB-WK Bild (has subject)
 - WAB-WK Uebereinkommen (has subject)
 - WAB-WK Ich (has subject)
 - Wittgenstein_Ludwig (has author)
 - Ts-213-065 Wie haeng... (has point)
 - WAB-WK Wen ein Bild ... (has point)
 - Ts-213 Intention and... (has subject)
 - WAB-WK Darstellung (has subject)
- Ontologies:** A list of ontologies including "WAB-WK Was macht eine Handlung die mit unterschiedlichen Regeln ueber...", "WAB-WK Was uns dazu veruehrt das Verstehen durch eine besondere A...", "WAB-WK Wen ein Bild darstellt liegt aufgrund von Uebereinkommen fest", "WAB-WK Wie jede Rechtfertigung algebraischer Aufgaben aussieht", "WAB-WK Woran sich zeigt ob der der festlegt von wem ein Bild ein Portra...", and "WAB-WK Worte fuer eine Beschreibung waelhen als aeusserer Vorgang". Other categories include Event, Fictional Entity, Object, and Person.

The Windows taskbar at the bottom shows the Start button, several open applications (Internet Explorer, Microsoft PowerPoint, Sogndal10, Towards tabl..., Dokument1 - ...), and the Philospace V2... application. The system tray includes the Google search bar, network status, and the time 10:44 AM.