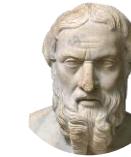


Σημασιολογικά δεδομένα και αναπαράσταση της ιστορικής γνώσης: το παράδειγμα της Οντολογίας LACRIMALit

Μ. Παπαδοπούλου, Ε. Μ. Ταμιωλάκη

кризис

危機



crisis

crisi

危機

кризис



crise

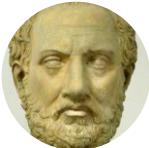
संकट



krīsic

crise

κρīsic



кризис

crisi

ازمة



krise



crisis



crisis

κρίση





Περιεχόμενα

- Στόχοι LACRIMALit
- Κείμενα - πηγές
- Οντολογία LACRIMALit
- Οντολογία: για ποιο σκοπό;
 - Οντολογίες στις ΨΑΕ
 - Μοντέλα Γεγονότων
 - Το μοντέλο LACRIMAHist
 - Η LACRIMAHist στο Protégé
 - Ερωτήσεις Επάρκειας
- Συμπεράσματα



Ταυτότητα του έργου

ΦΟΡΕΑΣ ΥΠΟΔΟΧΗΣ:

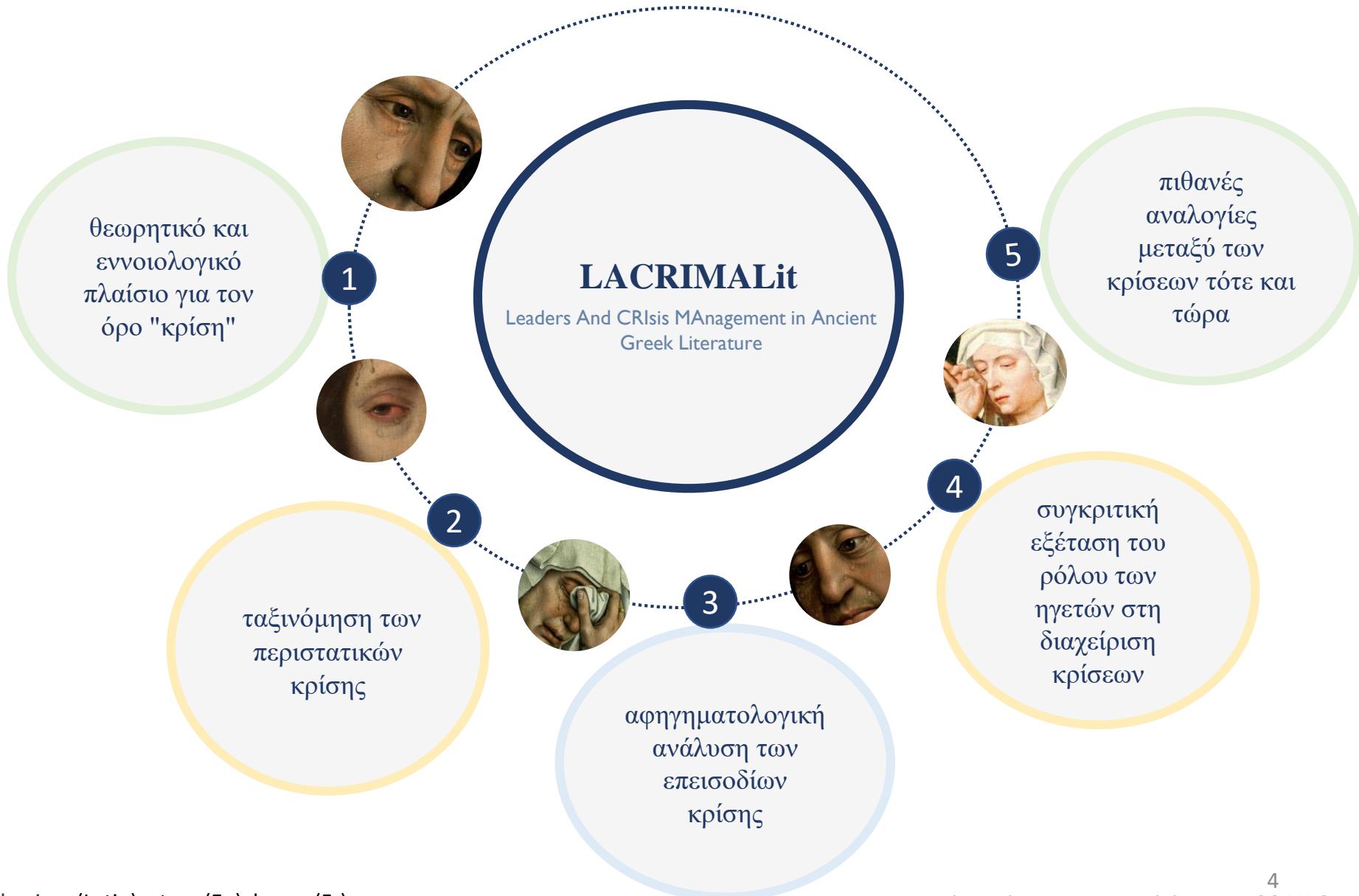


ΣΥΝΕΡΓΑΖΟΜΕΝΟΣ ΦΟΡΕΑΣ :



LACRIMALit

ΧΡΗΜΑΤΟΔΟΤΗΣΗ: ΕΛ.ΙΔ.Ε.Κ.



Κείμενα - πηγές

- Ηρόδοτος
- Θουκυδίδης
- Αριστοφάνης
- Ξενοφών
- Δημοσθένης
- Αισχίνης
- Πολύβιος
- Διόδωρος
- Διονύσιος Αλικαρνασσέας
- Πλούταρχος
- Αρριανός





Οντολογία

■ Τι;

Ένα είδος μοντέλου γνώσης για την ολοκληρωμένη περιγραφή ενός πεδίου. Περιλαμβάνει ένα κοινό λεξιλόγιο για να υποδηλώνει το σύνολο των εννοιών σε έναν τομέα, τους τύπους και τις ιδιότητες των εννοιών, καθώς και τις σχέσεις μεταξύ των εννοιών.

■ Γιατί;

Η πιο σημαντική πρακτική χρήση των οντολογιών βασίζεται στην αυτοματοποίηση της διαδικασίας παραγωγής συμπερασμάτων. Συγκεκριμένα, η περιγραφή των ιδιοτήτων των αντικειμένων του κόσμου και η ταξινόμησή τους σε κατηγορίες ..., σε συνδυασμό με την περιγραφή των σχέσεων που έχουν οι κατηγορίες αυτές (έννοιες), ... δίνει τη δυνατότητα για επιπλέον ταξινομήσεις των αντικειμένων, αλλά και την εξαγωγή επιπλέον συσχετίσεων μεταξύ των εννοιών.

Στάμου 2015, 57

Υπολογισμότητα αναπαράσταση της γνώσης με τρόπο που να μπορεί να υπολογιστεί από τον Η/Υ
Τυποποίηση αυτοματοποιημένη συλλογιστική

Ανακάλυψη της γνώσης εξηγήσιμη ανάκληση πληροφοριών

Σημασιολογική διαλειτουργικότητα επικοινωνία με σαφήνεια εντός και μεταξύ κοινοτήτων

Απάντηση ερωτήσεων απαντήσεις σε σύνθετα ερωτήματα

Οντολογίες στις ΨΑΕ

Ontologies are more and more used in the Digital Humanities, although still in an unsystematic and uncoordinated fashion.

Jansen 2019

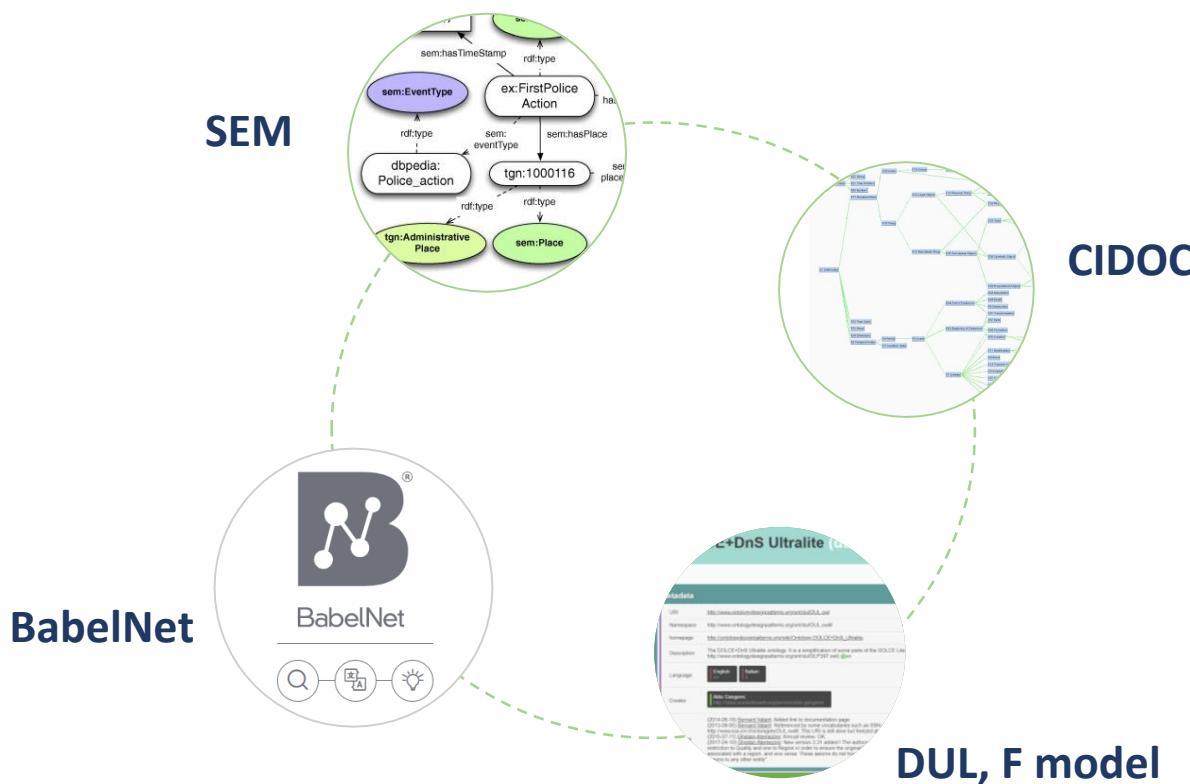
The ability to automatically determine relations between historical events and their sub-events over textual data, based on the relations between event participants, time markers and locations, will have important repercussions for the design of historical information retrieval systems.

Cybulski & Vossen 2010

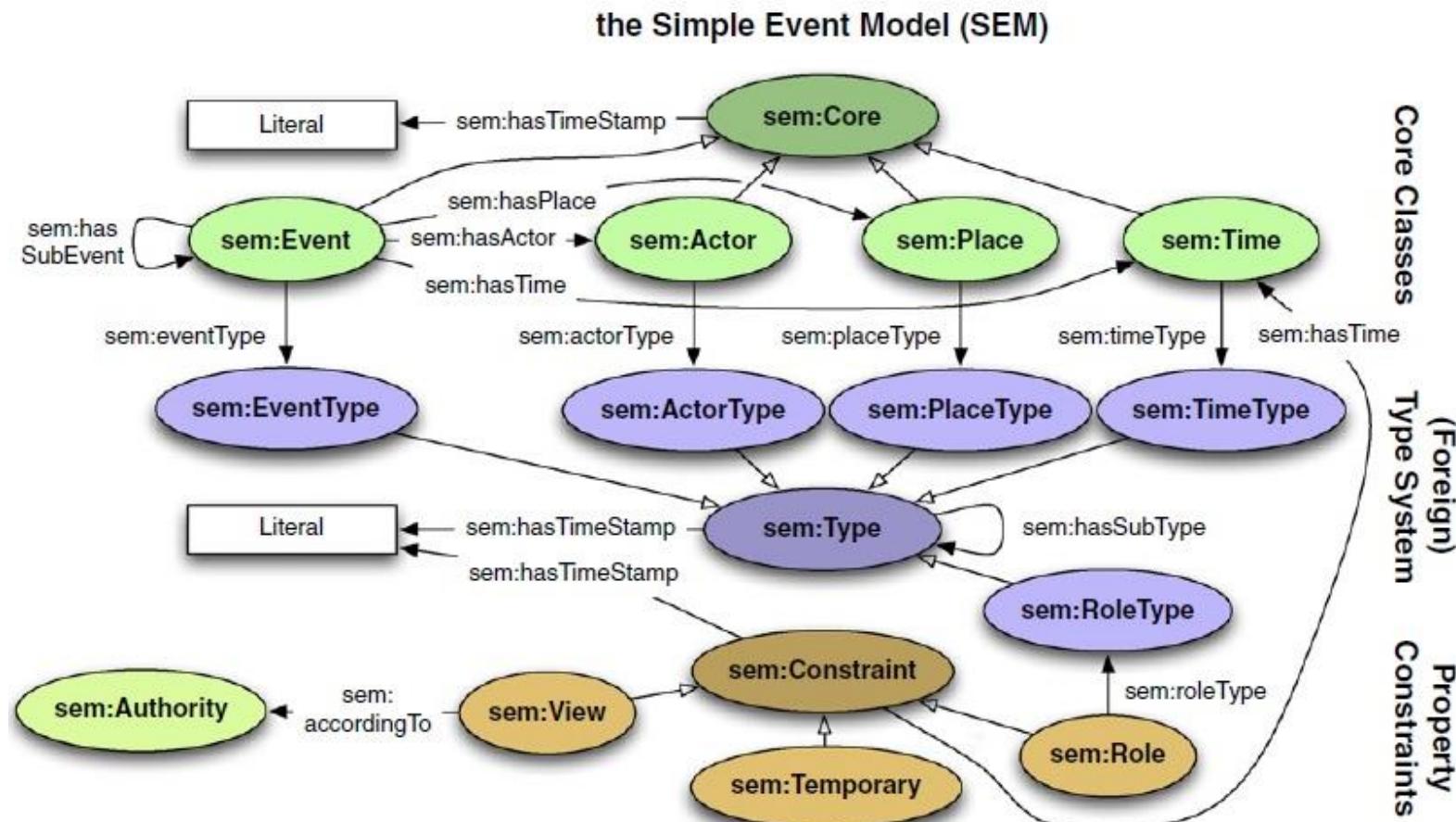
Οι οντολογίες χρησιμοποιούνται όλο και περισσότερο στις Ψηφιακές Ανθρωπιστικές Επιστήμες, αν και ακόμη με μη συστηματικό και ασυντόνιστο τρόπο.

Η ικανότητα αυτόματου προσδιορισμού σχέσεων μεταξύ ιστορικών γεγονότων και των επιμέρους γεγονότων τους σε κειμενικά δεδομένα, με βάση τις σχέσεις μεταξύ των συμμετεχόντων στα γεγονότα, των χρονικών σημείων και των τοποθεσιών, θα έχει σημαντικές επιπτώσεις στο σχεδιασμό συστημάτων ανάκτησης ιστορικών πληροφοριών.

Μοντέλα Γεγονότων



Simple Event Model (SEM)



E5 Event in Version 6.2

Subclass of : E4 Period

Superclass of: E7 Activity, E63 Beginning of Existence, E64 End of Existence

Scope Note:

This class comprises changes of states in cultural, social or physical systems, regardless of scale, brought about by a series or group of coherent physical, cultural, technological or legal phenomena. Such changes of state will affect instances of E77 Persistent Item or its subclasses.

The distinction between an E5 Event and an E4 Period is partly a question of the scale of observation. Viewed at a coarse level of detail, an E5 Event is an 'instantaneous' change of state. At a fine level, the E5 Event can be analysed into its component phenomena within a space and time frame, and as such can be seen as an E4 Period. The reverse is not necessarily the case: not all instances of E4 Period give rise to a noteworthy change of state.

Examples:

- the birth of Cleopatra (E67)
- the destruction of Herculaneum by volcanic eruption in 79 AD (E6)
- World War II (E7)
- the Battle of Stalingrad (E7)
- the Yalta Conference (E7)
- my birthday celebration 28-6-1995 (E7)
- the falling of a tile from my roof last Sunday
- the CIDOC Conference 2003 (E7)

In First Order Logic:

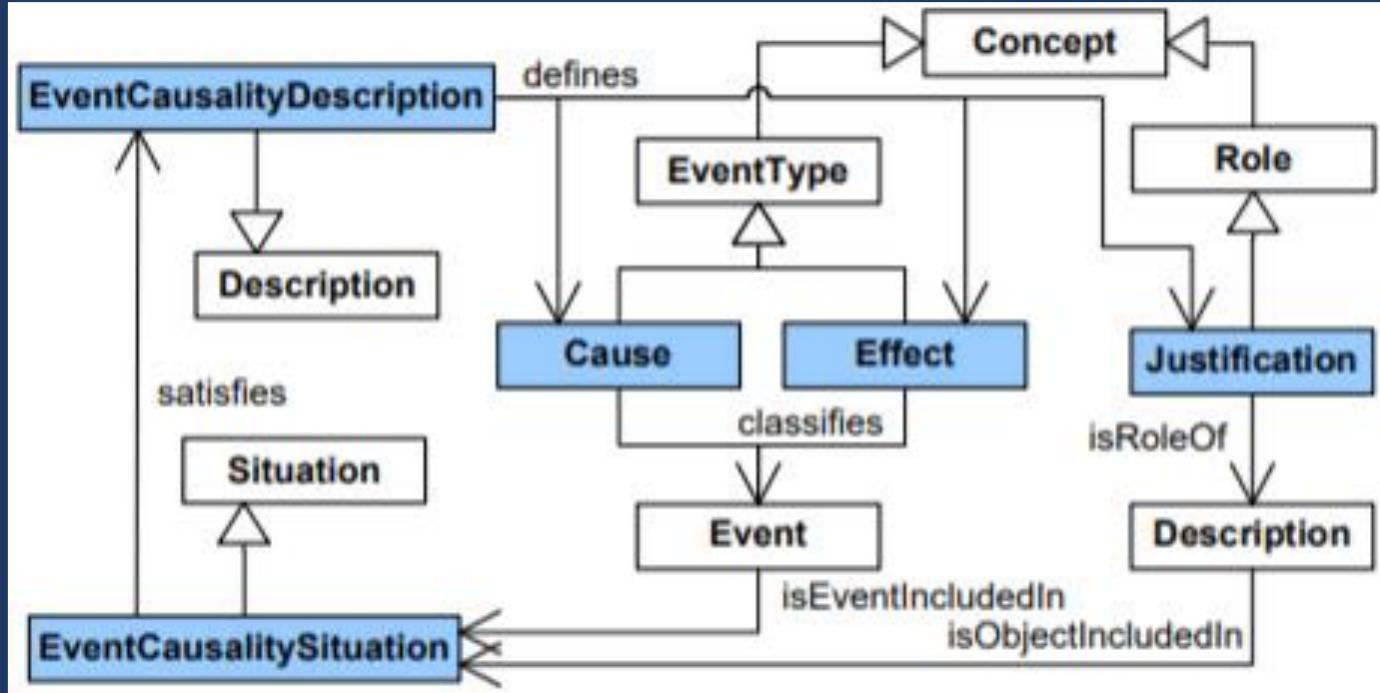
$E5(x) \supset E4(x)$

Properties:

P11 had participant (participated in) : E39 Actor,

P12 occurred in the presence of (was present at) : E77 Persistent Item

Event Model-F

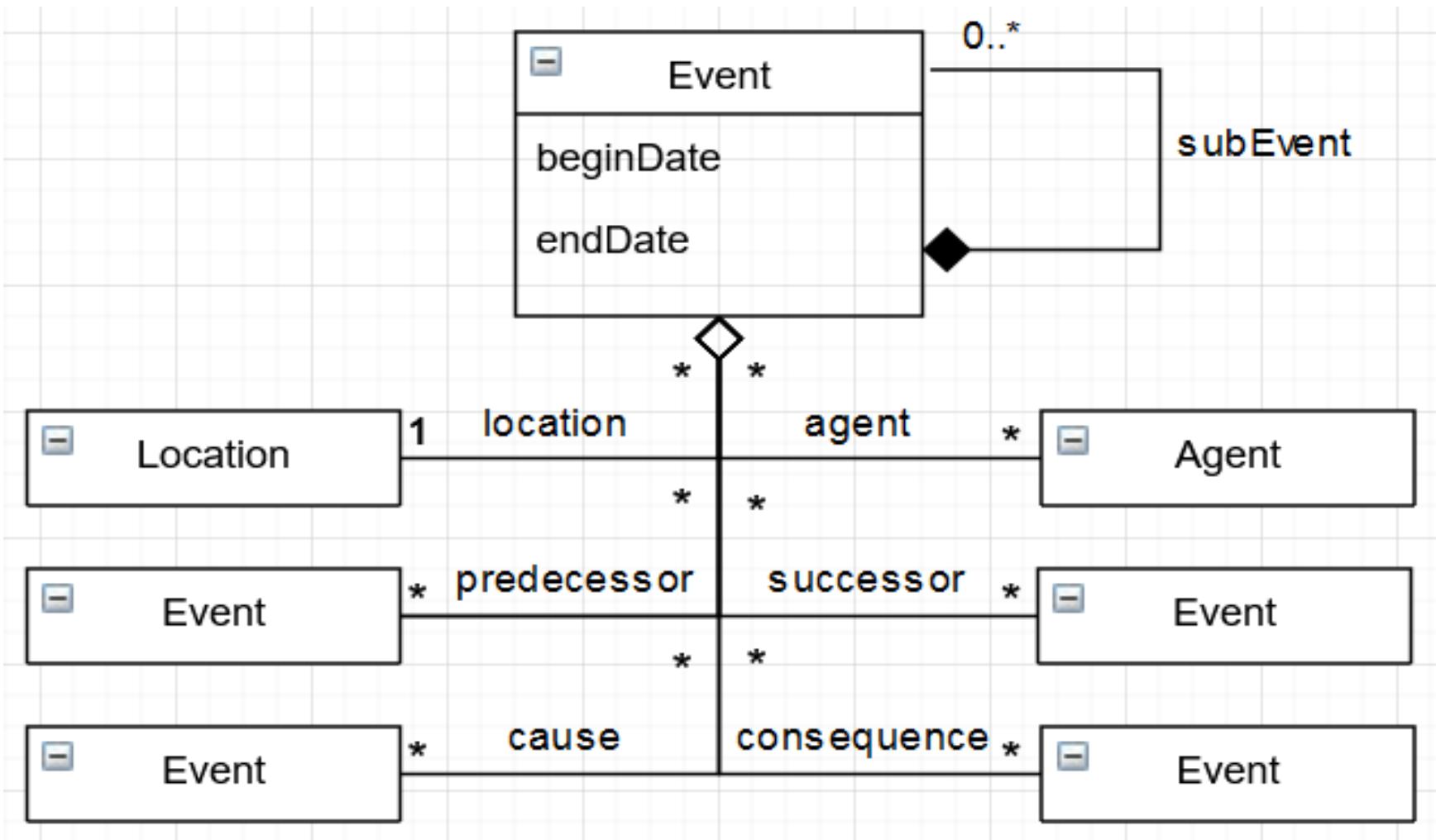


Scherp et al. 2010

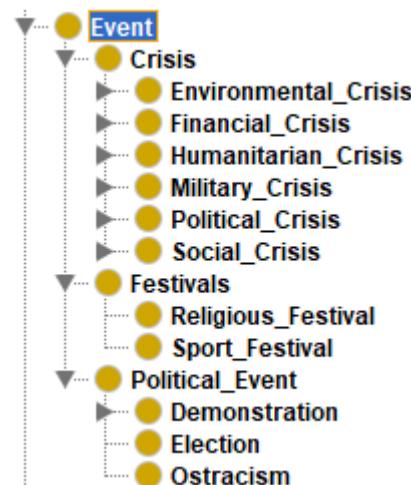
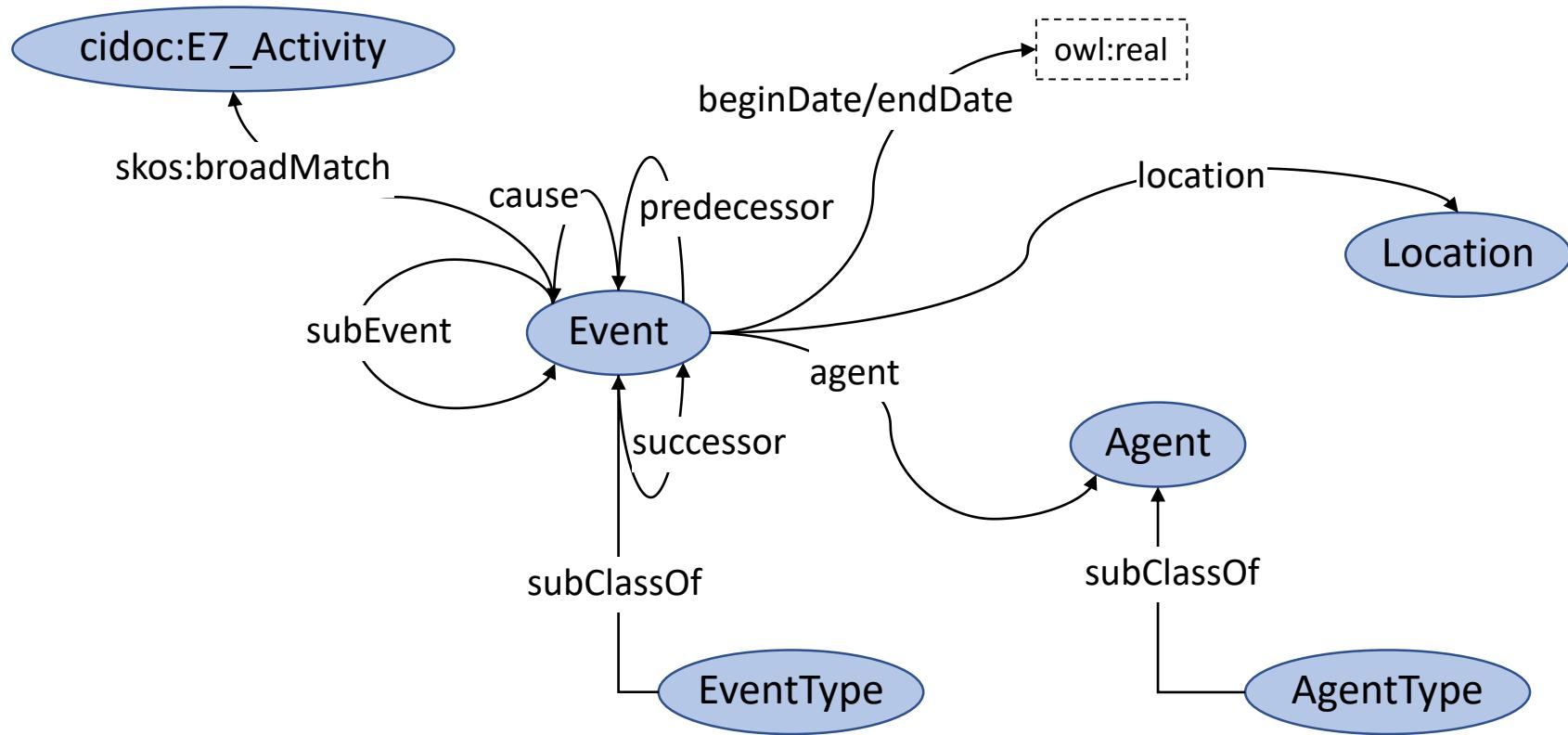
f:Event

“perdurating entities (or perdurants or occurants) that unfold over time”

Μοντέλο LACRIMALit



Η «κρίση» ως γεγονός



Σύνδεση με CIDOC

skos:broadMatch “http://erlangen-crm.org/200717/E7_Activity”

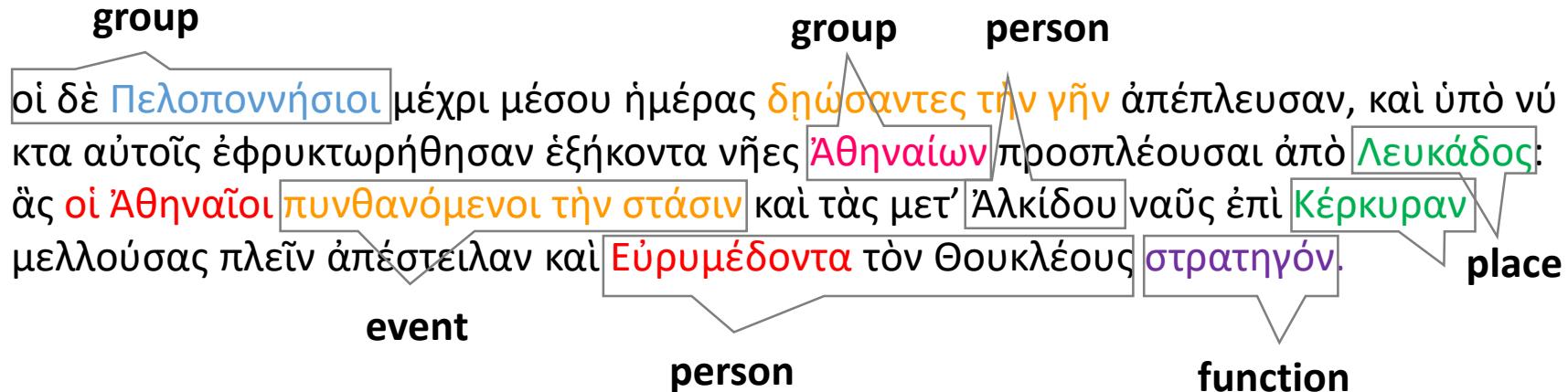
E7 Activity in Version 6.2

<http://www.cidoc-crm.org/Entity/e7-activity/version-6.2>

“This class comprises actions intentionally carried out by instances of E39 Actor that result in changes of state in the cultural, social, or physical systems documented. This notion includes complex, composite and long-lasting actions such as the building of a settlement or a war, as well as simple, short-lived actions such as the opening of a door.”

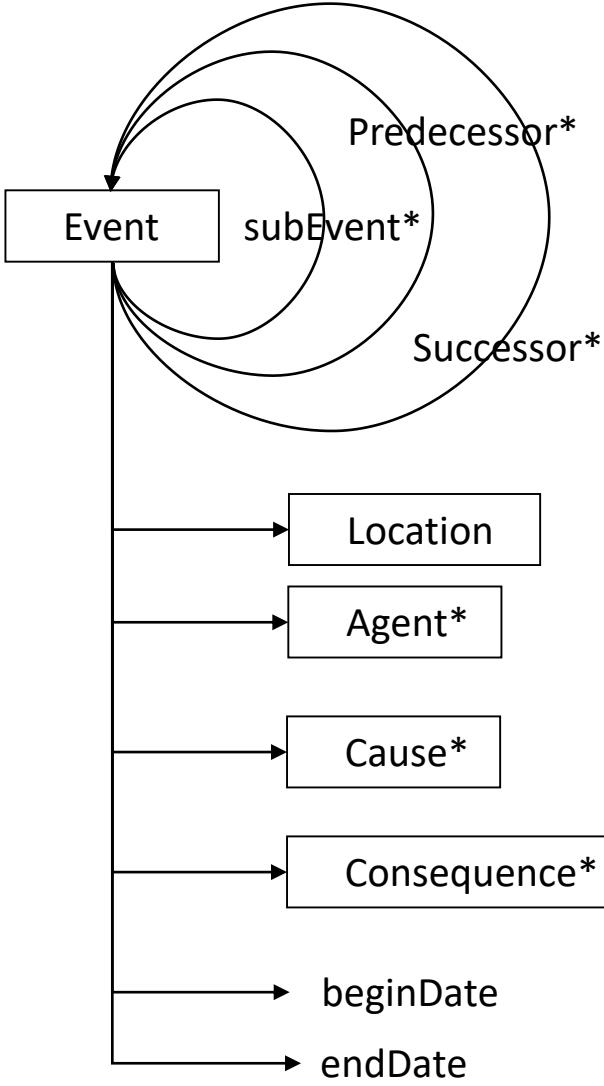
Παράδειγμα χωρίου

Θουκ. 3.80.2



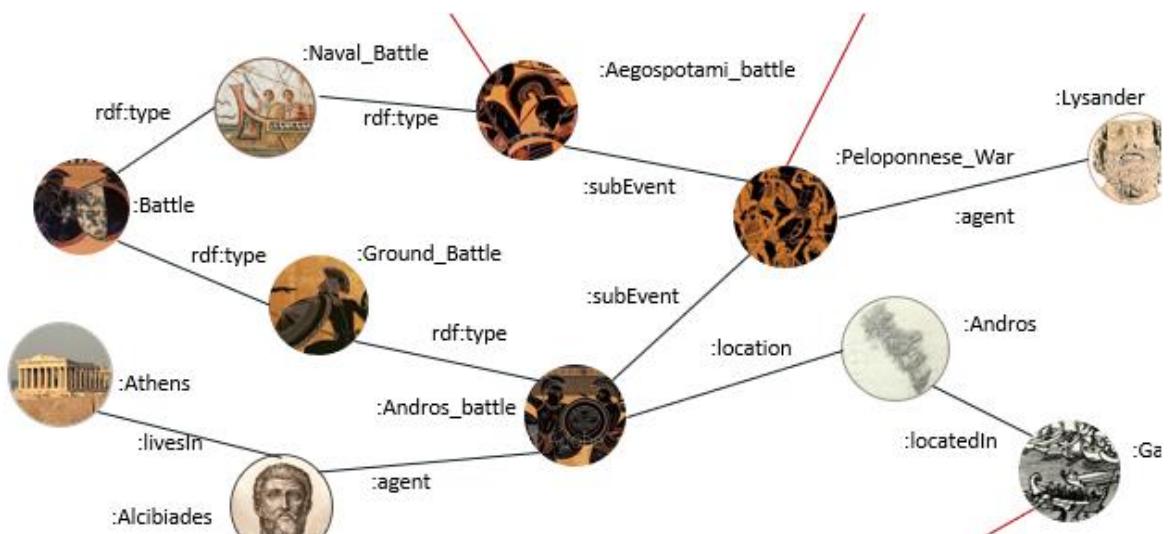
[3.80.2] But the Peloponnesians, after devastating the land till about midday, retired. And at nightfall the approach of sixty Athenian vessels was signalled to them from Leucas. These had been sent by the Athenians under the command of Eurymedon the son of Thucles, when they heard of the revolution and of the intended expedition of Alcidas to Corcyra.

Μοντελοποίηση γεγονότων



Taxonomy: classes - relations (properties) - individuals

Class	Property	Individual
:War		:Peloponnese_War
:Naval_Battle		:Aegospotami_battle
:location	:locatedIn	:Gaurium
:agent		:Alcibiades



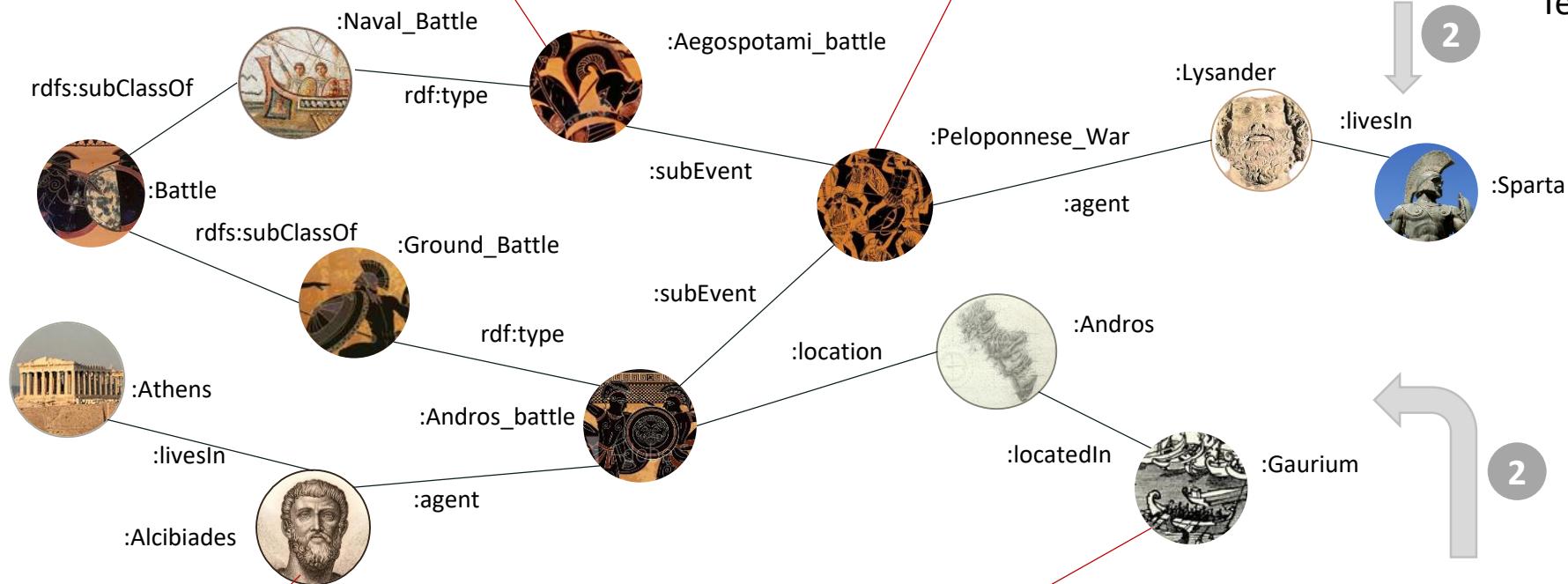
<https://github.com/MariaPapadopoulou/Ontology-of-crisis/blob/main/OntologyCrisis.owl>

The **Battle of Aegospotami** was a naval confrontation that took place in 405 BC and was the last major **battle** of the **Peloponnesian War**.

https://en.wikipedia.org/wiki/Battle_of_Aegospotami



- battle of Aegospotami
- Peloponnesian War
- naval battle



Terms



2

Xen. Hell. 1.4 **Alcibiades** disembarked his army at **Gaurium**, in the territory of **Andros**; and when the men of Andros and the **Laconians** who were there came forth to meet him, the **Athenians** routed them, shut them up in their city, and killed some few of them.

<http://www.perseus.tufts.edu/hopper/text?doc=Perseus%3Atext%3A1999.01.0206%3Abook%3D1%3Achapter%3D4>



Terms

- Alcibiades
- Gaurium
- Andros
- Laconians
- Athenians

Ἀλκιβιάδης δὲ τὸ στράτευμα ἀπεβίβασε τῆς Ἀνδρίας χώρας εἰς Γαύριον:
ἐκβοηθήσαντας δὲ τοὺς Ἀνδρίους ἐτρέψαντο καὶ κατέκλεισαν εἰς τὴν πόλιν καὶ
τινας ἀπέκτειναν οὐ πολλούς, καὶ τοὺς Λάκωνας οὖ αὐτόθι ἤσαν.

<http://www.perseus.tufts.edu/hopper/text?doc=urn:cts:greekLit:tlg0032.tlg001.perseus-grc1:1.4>

Μοντελοποίηση συγκεκριμένου γεγονότος

Class hierarchy: Political_Performed_Funct

Annotations: political_function_1

owl:Thing
Function
Agent
Concept
Event
Performed_function
Military_Performed_Function
Political_Performed_Function
Crisis
Environmental_Crisis
Financial_Crisis
Humanitarian_Crisis
Military_Crisis
Battle
Land_Battle
Naval_Battle
Invasion
Pillage
War
Political_Crisis
Social_Crisis

Annotations: political_function_1

rdfs:comment [language: en]
During 406, he participated as a member of the Boule. His tribe, the Antiochis, comprised the prytany on the day when it was debated what fate should befall the generals of the Battle of Arginusae, who had abandoned the slain as well as the survivors of foundered ships to pursue the defeated Spartan navy

rdfs:seeAlso
<https://en.wikipedia.org/wiki/Socrates>

Description: political_function_1

Types: Political_Performed_Function

Same Individual As

Different Individuals

Object property assertions:

- function prytane
- agent Socrates

Data property assertions:

- endDate -406
- beginDate -406

Negative object property assertions

Negative data property assertions

Direct instances: political_function_1

For: Political_Performed_Function

- political_function_1
- political_function_2

Political_Performed_Function

political_function_1

prytane

Socrates

agent

function

beginDate

endDate

Οντολογία LACRIMALit - Protégé

Annotations tab

rdfs:comment

Annotations: Peloponnesian_War

Annotations +

rdfs:comment [language: en]

[2] But the Argives, Athenians, Boeotians, and those among the Corinthians who had received a share of the money from the King, as well as those who had made themselves chiefly responsible for the war, realizing that if they did not put out of the way the people who had turned toward peace, the state would be in danger of going over to the Lacedaemonians again, undertook, under these circumstances, to bring about a general massacre. And in the first place, they devised the most sacrilegious of all schemes; for other people, even if a man is condemned by process of law, do not put him to death during a religious festival; but these men chose the last day of the Euclea,² because they thought they would catch more people in the market-place, so as to kill them.
<http://www.perseus.tufts.edu/hopper/text?doc=Perseus%3Atext%3A1999.01.0206%3Abook%3D4%3Achapter%3D4%3Asection%3D2>

rdfs:comment [language: grc]

[4.4.2] Τότε οι Αργείοι, οι Αθηναίοι και οι Βοιωτοί, καθώς κι όσοι Κορίνθιοι είχαν πληρωθεί από τα χρήματα του Βασιλέως κι όσοι είχαν σταθεί πρωταρίτοι του πολέμου, καταλάβαναν ότι, αν δεν εξουδετέρωναν την ειρηνόφιλη μερίδα, υπήρχε κίνδυνος να προσχωρήσει η πόλη ξανά στους Λακεδαιμονίους· γι' αυτό οργάνωσαν σφαγή.
https://www.greek-language.gr/digitalResources/ancient_greek/library/browse.html?text_id=32&page=41&hi=311782

rdfs:seeAlso

<http://www.perseus.tufts.edu/hopper/text?doc=urn:cts:greekLit:tlg0032.tlg001.perseus-grc1:4.4.2>

Description: Peloponnesian_War

Property assertions: Peloponnesian_War

Types +

War

Same Individual As +

Different Individuals +

Object property assertions +

- agent Athenians
- location Peloponnesus
- agent Lysander
- agent Alcibiades
- agent Andrians
- subEvent Aegospotami_battle
- subEvent Andros_battle
- subEvent Arginoussai_battle
- agent Laconians

Data property assertions +

- endDate -404
- beginDate -431

Class hierarchy: War

Asserted

Annotations Usage

owl:Thing Agent Event Crisis Environmental_Crisis Drought Earthquake Inundation Financial_Crisis Humanitarian_Crisis Military_Crisis Battle Land_Battle Naval_Battle Invasion Pillage War Political_Crisis Social_Crisis Festivals Political_Event Location Term

Direct instances: Peloponnesian_War

For: War

Peloponnesian_War

Protégé

Property assertions tab

Data property assertions

19 @ x o

Ερώτημα SPARQL

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX ont: <http://o4dh.com/Ontologies/Crisis.owl#>
SELECT DISTINCT *
  WHERE {
    ?crisis rdfs:subClassOf* ont:Crisis.
    ?crisis rdfs:label ?crisisLabel
  }
  ORDER BY ?crisis
```

Ο όρος είναι επικέτα για την έννοια

The diagram illustrates the relationship between the **Crisis** class and its labels. A yellow circle labeled "Crisis" is connected by a line labeled "rdfs:label" to a dashed box containing the English label "crisis" and the Greek label "κρίση".

SPARQL query:

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX ont: <http://o4dh.com/Ontologies/Crisis.owl#>
SELECT DISTINCT *
  WHERE {
    ?crisis rdfs:subClassOf* ont:Crisis.
    ?crisis rdfs:label ?crisisLabel
  }
  ORDER BY ?crisis
```

Results:

crisis	crisisLabel
Crisis	"κρίση"@el
Crisis	"crisis"@en
Crisis	"drought"@en
Drought	"environmental crisis"@en
Environmental_Crisis	"περιβαλλοντική κρίση"@el
Environmental_Crisis	"environmental crisis"@en
Financial_Crisis	"financial crisis"@en
Financial_Crisis	"οικονομική κρίση"@el
Humanitarian_Crisis	"humanitarian crisis"@en
Humanitarian_Crisis	"ανθρωπιστική κρίση"@el

Execute

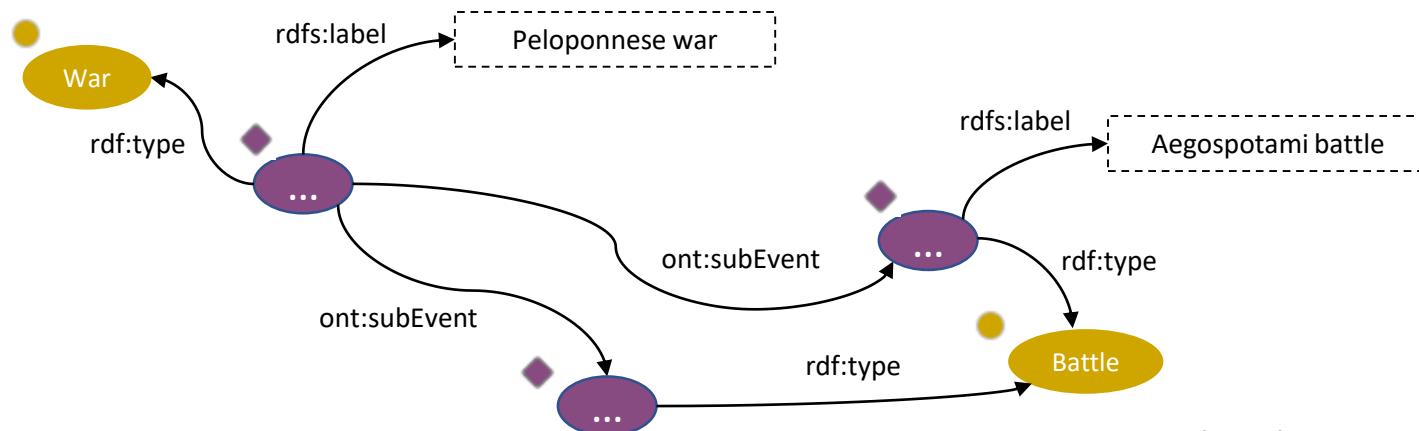
Ερώτημα SPARQL

What are the battles of the Peloponnese War?

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX ont: <http://o4dh.com/Ontologies/Crisis.owl#>
SELECT ?battleName
WHERE { ?war rdf:type ont:War.
      ?war rdfs:label "Peloponnese war" @en.
      ?war ont:subEvent ?battle.
      ?battle rdf:type ont:Battle.
      ?battle rdfs:label ?battleName
}
ORDER BY ?battleName
```

μάχες Πελοποννησιακού πολέμου

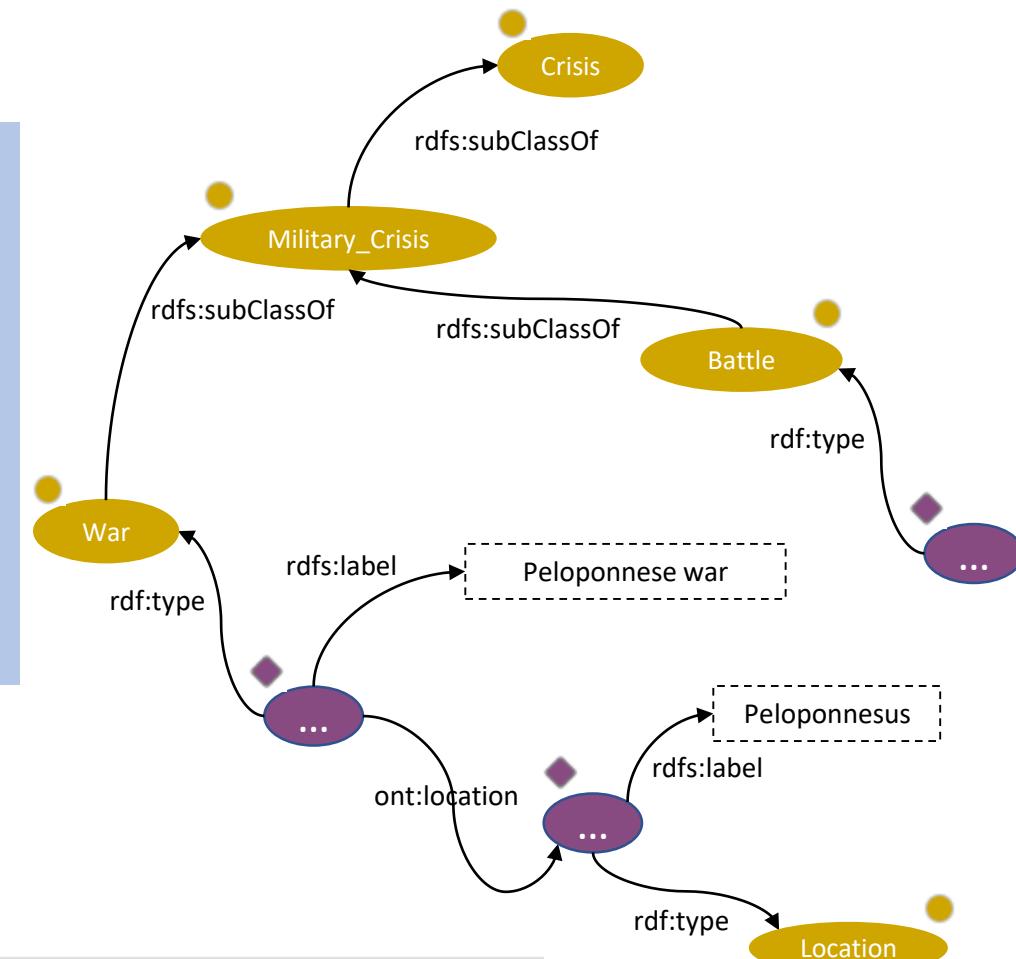
battleName
"Aegospotami battle"@en
"Andros battle"@en
"Arginoussai battle"@en



Ερώτημα SPARQL

Crises and locations?

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>
PREFIX owl: <http://www.w3.org/2002/07/owl#>
PREFIX rdfs: <http://www.w3.org/2000/01/rdf-schema#>
PREFIX xsd: <http://www.w3.org/2001/XMLSchema#>
PREFIX ont: <http://o4dh.com/Ontologies/Crisis.owl#>
SELECT DISTINCT ?crisisLabel ?crisisType ?location
WHERE { ?Crisis rdfs:subClassOf* ont:Crisis.
         ?crisis rdf:type ?Crisis.
         ?crisis rdfs:label ?crisisLabel.
         ?crisis ont:location ?location.
         ?crisis rdf:type ?crisisType.
         FILTER (?crisisType != owl:NamedIndividual)
}
ORDER BY ?crisisLabel
```



crisisLabel	crisisType	location
"Aegospotami battle"@en	Battle	Aegospotami
"Andros battle"@en	Battle	Gavron
"Arginoussai battle"@en	Battle	Arginusae
"Arginoussai battle"@en	Naval_Battle	Arginusae
"Peloponnesian war"@en	War	Peloponnesus

Συμπέρασμα & συνέχεια



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