

# UNDO: the United Nations System Document Ontology

Paper (HTML): <https://w3id.org/people/essepuntato/papers/undo-iswc2017.html>

Paper (DOI): [https://doi.org/10.1007/978-3-319-68204-4\\_18](https://doi.org/10.1007/978-3-319-68204-4_18)

Slides (HTML): <https://w3id.org/people/essepuntato/presentations/undo-iswc2017.html>

Slides (DOI): <https://doi.org/10.6084/m9.figshare.5527216>

**Silvio Peroni**    • **Monica Palmirani** • **Fabio Vitali**

16th International Semantic Web Conference (ISWC 2017), 21-25 October 2017, Vienna, Austria



Creative Commons Attribution 4.0 International License



# UN Documents

The parliamentary, normative and judicial documents published by the United Nations System of organizations are full of references to real-world objects and concepts (documents, people, organizations, roles, etc.)

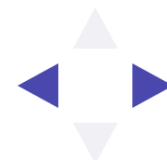
As an outcome of the High-Level Committee on Management (HLCM) Working Group on Document Standards, the United Nations has recently started to adopt [Akoma Ntoso](#) for providing an electronic representations of all UN Documents and the entities they contain



# Akoma Ntoso

Akoma Ntoso introduce a sort of informal ontological structure, according to two kinds of classes:

- **document classes** focus on representing the different aspects of a document as intellectual creation, the forms (versions, translations, etc.), its physical embodiment (e.g. PDF, XML, HTML, paper, etc.);
- **non-document classes** focus on representing the responsible for the production of the content and what the content is about (e.g. concept, object, event, locations, roles, deliberation steps, etc.).



# Informal requirements

1. Compliance with the Functional Requirements for Bibliographic Records (FRBR) for the document classes
2. Reuse existing ontologies for the description of documents and the entities they contain
3. Alignment to foundational ontologies (BFO and DOLCE)
4. Easily adaptable to the needs of different UN agencies
5. Diagrams and real examples for introducing ontological terms and their use to domain experts
6. Extensive documentation so as to introduce the ontology to people with different expertises
7. Meeting every 7-10 days showing the status of the development

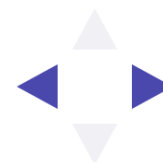


# UNDO

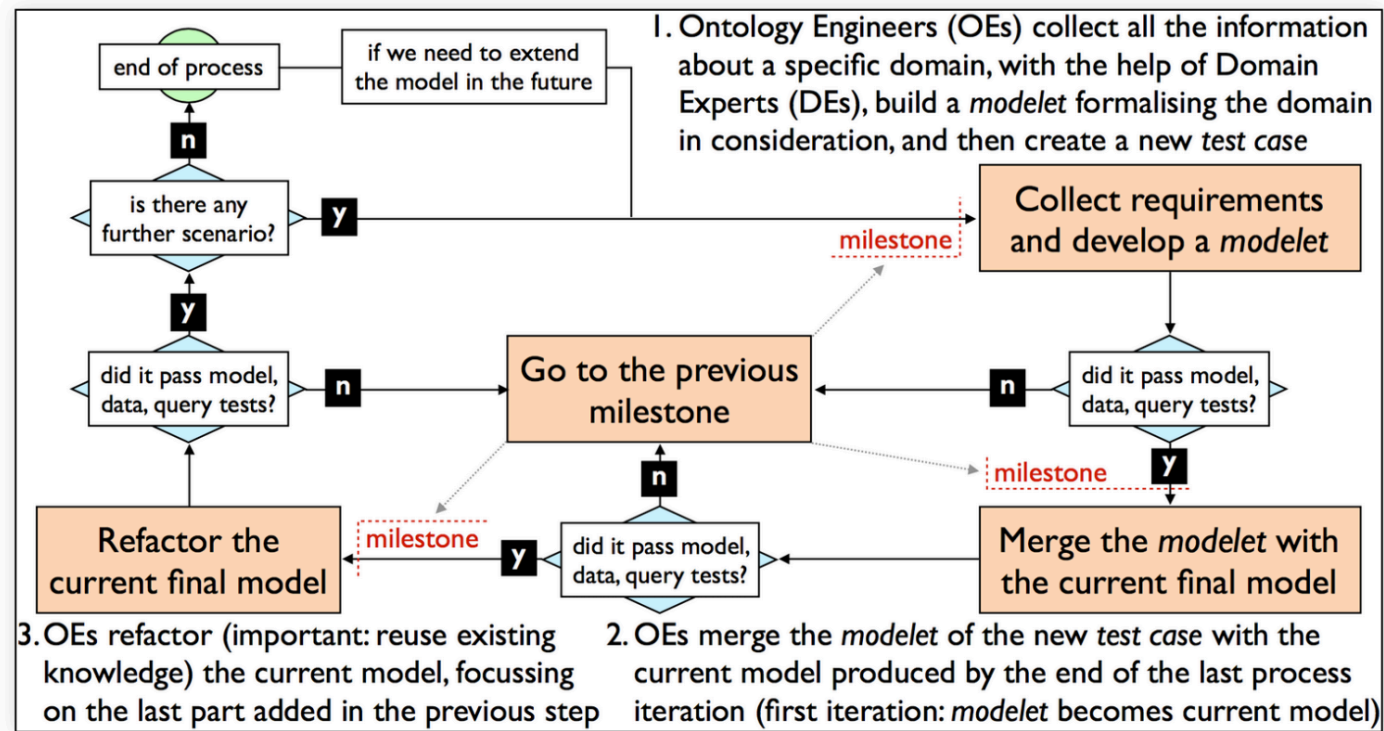
The United Nations System Document Ontology (UNDO, <https://w3id.org/un/ontology/undo>) is an OWL 2 DL ontology that aims at providing a framework for the formal description of all entities and the relations in UN Documents

UNDO follows the [FAIR Data Principles](#):

- Findable: [w3id.org](https://w3id.org) persistent identifier
- Accessible: different formats (via content negotiation)
- Interoperable: uses several existing ontologies
- Re-usable: available with a CC-BY license



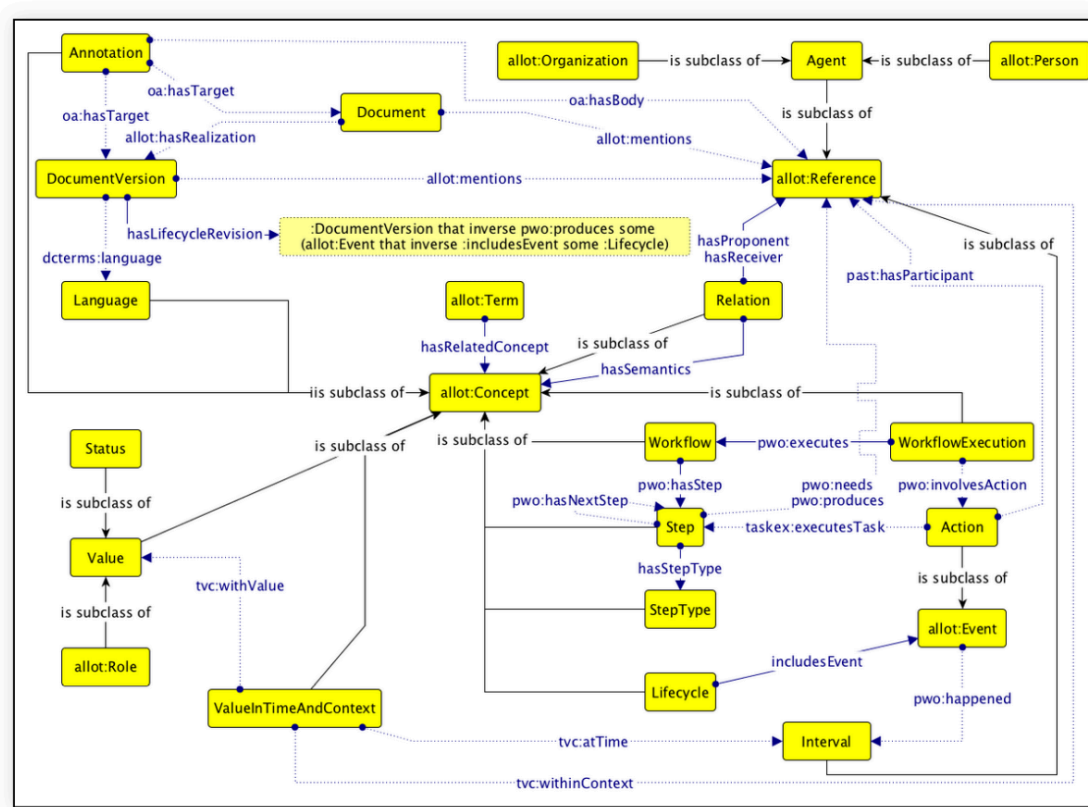
# Development: SAMOD



An agile methodology for the development of ontologies by means of small steps of an iterative workflow that focuses on creating well-developed and documented models starting from exemplar domain descriptions – <https://github.com/essepuntato/samod>



# Development: Graffoo



It allows one to present the classes, properties and restrictions within OWL ontologies, or sub-sections of them, as clear and easy-to-understand diagrams

<http://www.essepuntato.it/graffoo>





# Development: DiTTO and LODE



It translates diagrams expressed either in Graffoo and created with yEd, an open source application to quickly and effectively generate high-quality diagrams, into OWL ontologies  
<http://www.essepuntato.it/ditto>



It automatically extracts classes, object properties, and other ontological entities, and renders them in a human-readable HTML documentation designed for browsing and navigation  
<http://www.essepuntato.it/lode>





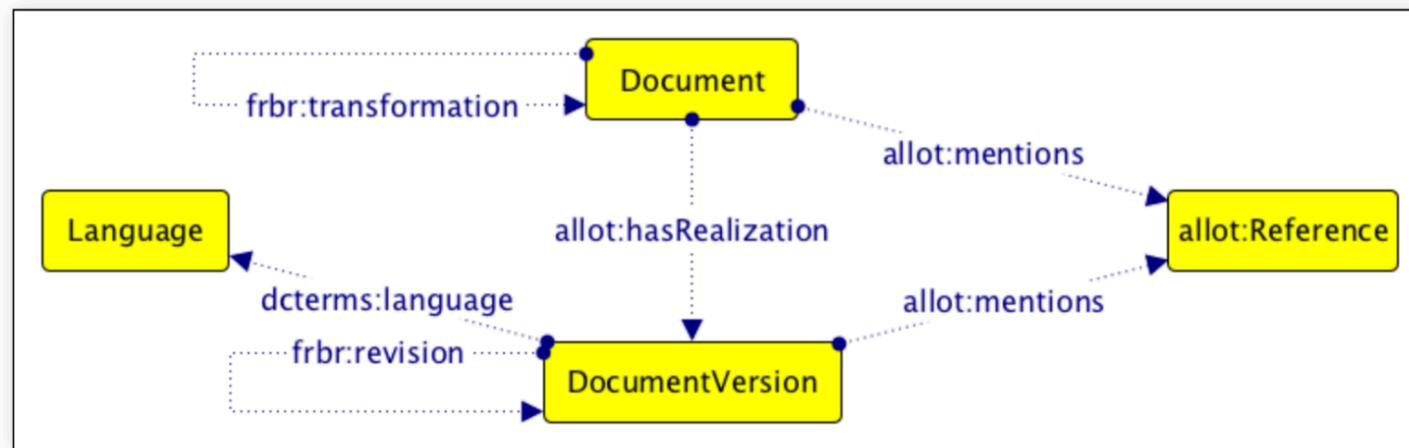
# Ontologies reused

**ALLOT**: an OWL 2 DL implementation of the Top Level Classes (TLCs) in Akoma Ntoso, aligned to two important foundational ontologies, **BFO** and **DOLCE**, to provide a methodological organization of all the TLCs and their relations

Other: **Time-indexed Value in Context**, **Time Interval**, **Web Annotation Ontology**, **DC Terms**, **FOAF**, **ISO 639-1**, **LKIF Core**, **SKOS**, **SPAR Ontologies**



# Versions and mentions

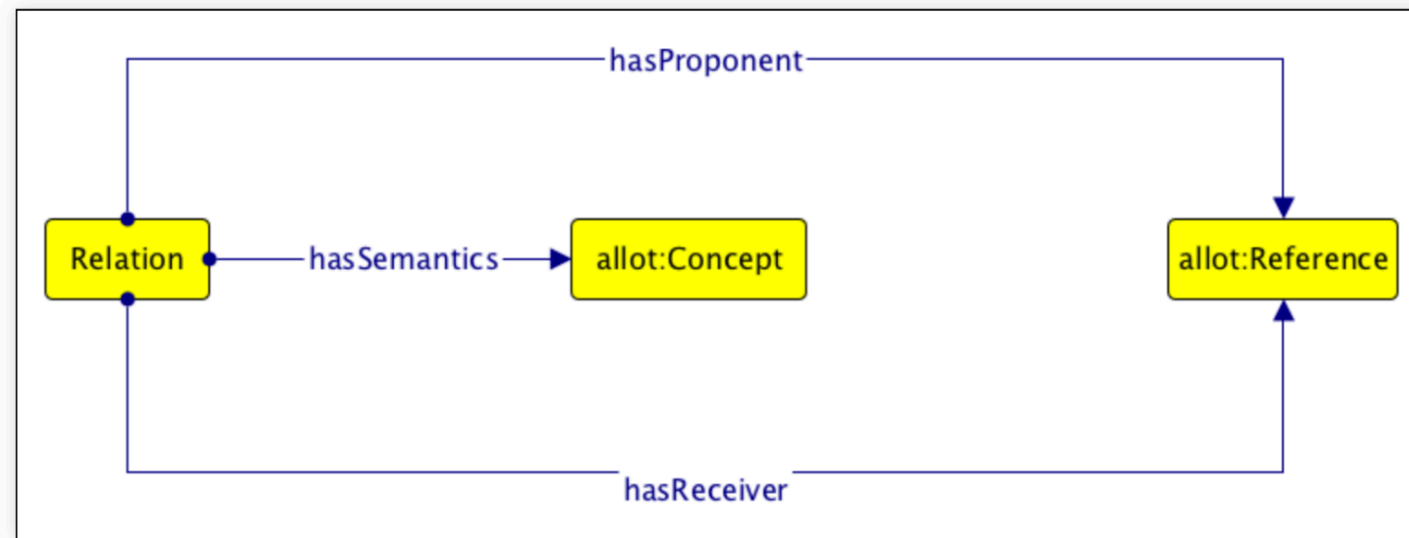


```
:a-res-50-100-1996-02-02 a undo:Resolution ;
  allot:mentions
    :a-res-47-180-1992-12-22 ,
    :government-of-turkey ,
    :habitat-ii .

:a-res-47-180-1992-12-22 a undo:Resolution .
:government-of-turkey a allot:Organization .
:habitat-ii a allot:Event .
```



# Relations

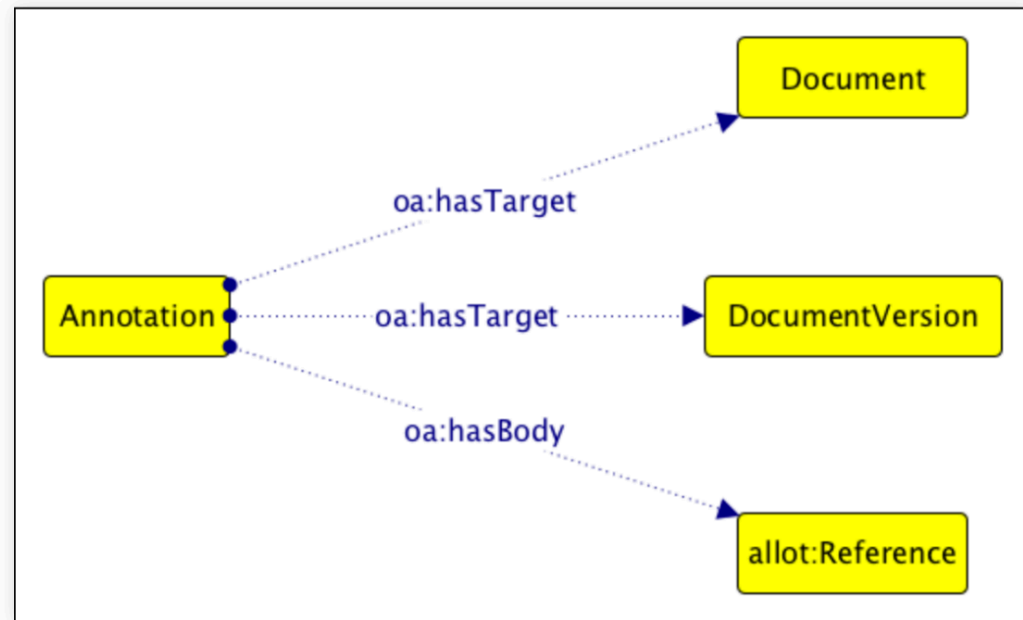


```
# This relation describes the General Assembly recalling the resolution A/RES/47/180.
:relation-1 a undo:Relation ;
  undo:hasProponent :general-assembly ;
  undo:hasSemantics :recall ;
  undo:hasReceiver :a-res-47-180-1992-12-22 .

:a-res-47-180-1992-12-22 a undo:Resolution .
:general-assembly a allot:Organization .
:recall a allot:Concept .
```



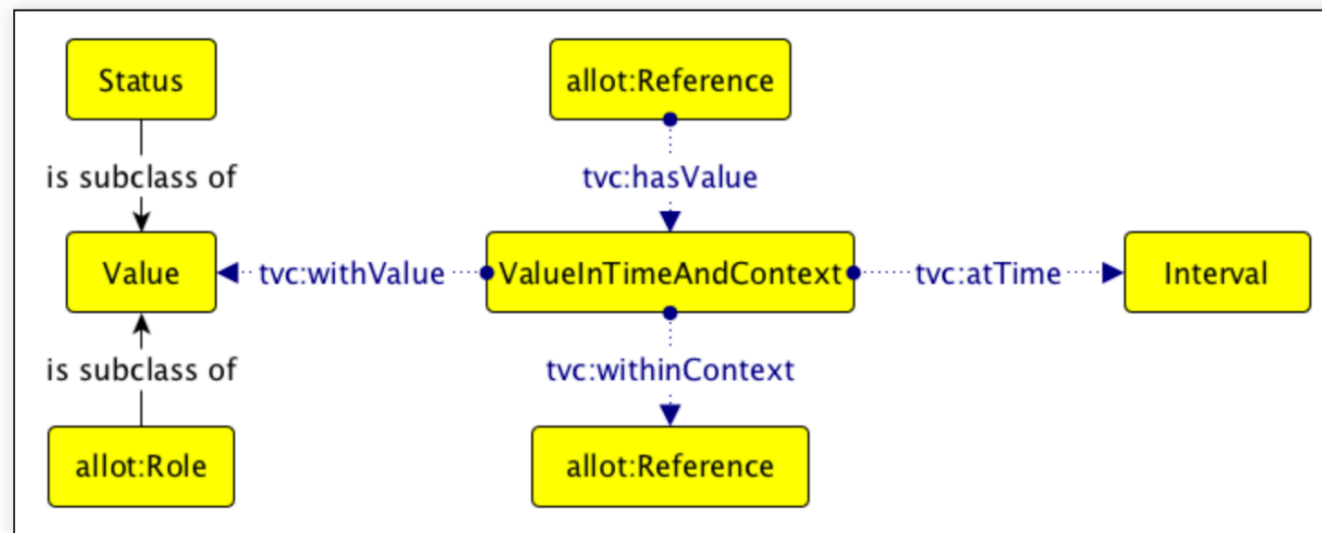
# Annotations



```
:annotation-1-a-res-50-100-1996-02-02 a undo:Annotation ;  
  oa:hasBody :relation-1 ;  
  oa:hasTarget :a-res-50-100-1996-02-02 .  
  
:a-res-50-100-1996-02-02 a undo:Resolution .
```

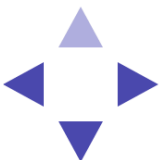


# Roles and statuses



```
:giorgio-napolitano a undo:Agent ;
    tvc:hasValue :giorgio-napolitano-president-of-italy-2006-2013 .
:giorgio-napolitano-president-of-italy-2006-2013 a undo:ValueInTimeAndContext ;
    tvc:withValue :president ;
    tvc:atTime :2006-2013 ;
    tvc:withinContext :italy .

:2006-2013 a undo:Interval ;
    ti:hasIntervalStartDate "2006-05-15T00:00:00"^^xsd:dateTime ;
    ti:hasIntervalEndDate "2013-04-22T00:00:00"^^xsd:dateTime .
:president a allot:Role .
:italy a allot:Reference .
```



# Question 1

What are all the documents that refer to the UN resolution A/RES/47/180 of 22 December 1992?

```
SELECT DISTINCT ?document
WHERE {
  ?document allot:mentions :a-res-47-180-1992-12-22 .
}
```



# Question 2

What are the documents that describes the General Assembly recalling the resolution A/RES/47/180 of 22 December 1992?

```
SELECT DISTINCT ?document
WHERE {
  ?rel a undo:Relation ;
      undo:hasProponent :general-assembly ;
      undo:hasSemantics :recall ;
      undo:hasReceiver :a-res-47-180-1992-12-22 .

  ?ann a undo:Annotation ;
      oa:hasBody ?rel ;
      oa:hasTarget ?document
}
```





# Question 3

How many times an agent has been assigned to a specific role?

```
SELECT DISTINCT ?agent ?role ?context (count(?agent) AS ?count)
WHERE {
  ?agent a undo:Agent ;
    tvc:hasValue ?value .

  ?value a undo:ValueInTimeAndContext ;
    tvc:withValue ?role ;
    tvc:withinContext ?context .

  ?role a allot:Role .
}
GROUP BY ?agent ?role ?context
```




# Other competency questions

- What are all the entities referred by the UN resolution A/RES/50/100 of 2 February 1996?
- What are all the terms that actually refer to the concept of taking a decision, and in which documents have been used?
- What are the current roles of all the agents?
- What roles have been held by Sergio Mattarella during his life?
- Which roles are involved in particular contexts?
- What are all the statuses that have been associated to all the documents?
- In which step of all the workflows the first version of a document has been produced?
- How many steps (on average) are used in each workflow?
- How much did it take to executing each step in each workflow execution?
- What was the last entities produced by all the workflow executions?




# Documentation

<https://unsceb-hlcm.github.io/onto-undo/index.html>



The United Nations System  
Document Ontology



UNITED NATIONS SYSTEM


CEB

Chief Executives Board  
for Coordination

---

HIGH-LEVEL COMMITTEE ON MANAGEMENT (HLCM)

Working Group on Document Standards



The United Nations System  
Document Ontology

A framework for the description of United Nations system documents' entities and their relationships

The UNDO is a living document, which will be subject to regular updates to incorporate new developments and requirements. The online version is available at <https://w3id.org/un/ontology/undo>; and shall be considered the latest and authoritative versions.

*This document was drafted in the context of the HLCM Working Group on Document Standards under the technical supervision of [Silvio Peroni](#).*

COVER

- [Background](#)
- [Introduction](#)

ALLOT: A Light Legal Ontology on TLCs

UNDO Structure

- [Documents and their versions](#)
- [Document types](#)
- [Documents mentioning other entities](#)
- [Relations](#)
- [Annotations to documents](#)
- [Terms and their semantics](#)
- [Values, time and context](#)
- [Workflows and their executions](#)

Future directions

- [Alignment with foundational ontologies](#)
- [Akoma Ntoso IRI resolver](#)
- [Akoma Ntoso to UNDO converter](#)
- [Extending the scope of the ontology](#)

Annex 1: Examples of scenarios that UNDO can describe

Annex 2: Methods and Material

- [Simplified Agile Methodology for Ontology Development](#)
- [Live OWL Documentation Environment](#)
- [Graphical Framework For OWL Ontologies](#)
- [Diagrams Transformation into OWL](#)
- [Other related ontologies](#)
- [A Light Legal Ontology On TLCs](#)
- [Publishing Workflow Ontology](#)



# Conclusions

Overview of the United Nations Document Ontology (UNDO), a framework for the description of all the entities mentioned in United Nations documents stored in Akoma Ntoso, and the relations that can exist among them

Put the foundations for making UN documents machine-readable, so as to foster collaboration, to reduce costs in information management across the system, and to allow the creation of innovative services



# END

UNDO: the United Nations System Document Ontology

**Silvio Peroni**    • **Monica Palmirani** • **Fabio Vitali**

16th International Semantic Web Conference (ISWC 2017), 21-25 October 2017, Vienna, Austria



Creative Commons Attribution 4.0 International License

