NewsReader Data Model ontology 0.2

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Authors:
Marco Rospocher, Luciano Serafini (FBK-Irst)
Francesco Corcoglioniti

Abstract

This specification describes the NewsReader Data Model Ontology, an OWL 2 ontology that formalizes the data model of the KnowledgeStore instance for the NewsReader project. The ontology provides a specialization of the KnowledgeStore Core Data Model ontology with respect to the three *Resource*, *Mention* and *Entity* representation layers. The ontology is based on the annotation guidelines of NewsReader WP3 (to be described in Deliverable D3.3.1: Annotated Data) and on the specification of the NLP Annotation Format (NAF) of NewsReader WP2 (to be described in Deliverable D2.1: System Design).

Status of This Document

The NewsReader Data Model ontology is a work in progress. This document describes the latest version of the ontology as currently used in the NewsReader KnowledgeStore instance.

Table of Contents

Overview

The following UML class diagram informally presents an overview of the ontology. Classes are rendered as UML classes, datatype properties as attributes and object properties as UML relations; minimum and maximum cardinalities and expected datatypes are also shown. The components of the ontology are detailed in the following sections.

ks:Resource
uri: URI
ks:storedAs:
  ks:Representation
rdfs:comment: string

ks:expressedBy 0..* ks:refersTo ks:describedBy 0..* ks:expresses

1 ks:containedIn

ks:Mention
uri: URI
nif:beginIndex: int
nif:endIndex: int
nif:anchorOf: string
rdfs:comment: string

0..1

ks:Entity
uri: URI

1..*
ks:describes

ks:Axiom
uri: URI
ks:encodedBy:
  rdf:Statement[1..*]
crystallized: bool
dc:source: URI
confidence: float
rdfs:comment: string

0..*

annotationOf

ks:referredBy
0..*

NAFDocument
version: string
dct:identifier: string
layer: NAFLayer[1..*]
dct:creator:
  NAFProcessor[1..*]
dct:language:
  dct:LinguisticSystem

ValueMention
valueType: ValueType

EntityMention
localCorefID: string

1 ks:holdsIn

ks:Context
uri: URI
sem:hasPointOfView:
  sem:PointOfView
sem:hasTimeValidity:
  time:Interval

0..1 csignal

CSignalMention

ObjectMention
syntacticHead: string
syntacticType: SyntacticType
entityType: EntityType
entityClass: EntityClass

News
dct:title: string
dct:publisher: dct:Agent
dct:creator: dct:Agent
dct:created: date
dct:spatial: dct:Location
dct:temporal:
  time:Interval
dct:subject: URI
dct:rights:
  dct:RightsStatement
dct:rightsHolder:
  dct:Agent
dct:language:
  dct:LinguisticSystem
originalFileName: string
originalFileFormat: string
originalPages: int

SignalMention

0..1 signal

RelationMention

target 1

source 1

TimeOrEventMention

valueFromFunction

Participation
thematicRole: string
framenetRef: URI
propbankRef: URI
verbnetRef: URI
nombankRef: URI

target 1

source

EventMention
eventClass:
  EventClass
pred: string
certainty: Certainty
factuality: Factuality
factualityConfidence:
  float
pos: PartOfSpeech
tense: Tense
aspect: Aspect
polarity: Polarity
modality: string
framenetRef: URI
propbankRef: URI
verbnetRef: URI
nombankRef: URI

TimeMention
value: string
timeType: TIMEX3Type
functionInDocument:
  FunctionInDocument
quant: string
freq: string
mod: TIMEX3Modifier
temporalFunction: bool

anchorTime

beginPoint

endPoint

TLink
relType: TLinkType

CLink
source 1
target 1
source

SLink
source 1
target 1

GLink
source 1
target 1

NAFProcessor
dct:title: string
version: string

ks:Representation
nie:mimeType: string
nfo:fileName: string
nfo:fileSize: int
nfo:fileCreated: date

sem:PointOfView
sem:accordingTo:
  rsem:Authority
sem:hasPointOfViewTime:
  time:Interval

Unless specified, attributes and relations have cardinality 0..1.

Attribute types:
- primitive XMLSchema types
- external entities referenced by URI:
  dct:Agent, dct:RightsStatement,
  dct:Location, dct:LinguisticSystem
- auxiliary classes with their attributes:
  NAFProcessor, ks:Representation,
  sem:PointOfView, time:Interval
- enums with URI value (the others)

Namespaces:
nwr: <http://dkm.fbk.eu/ontologies/newsreader#> (default, omitted)
ks: <http://dkm.fbk.eu/ontologies/knowledgestore#>
dct: <http://purl.org/dc/terms/>
nie: <http://www.semanticdesktop.org/ontologies/2007/01/19/nie#>
nfo: <http://www.semanticdesktop.org/ontologies/2007/03/22/nfo#>
nif: <http://nlp2rdf.lod2.eu/schema/string/>
sem: <http://semanticweb.cs.vu.nl/2009/11/sem/>
time: <http://www.w3.org/2006/time#>

Enumeration values (nwr: namespace)
ValueType: value_percent, value_money, value_quantity
Certainty: certain, uncertain
Factuality: factual, counterfactual, non_factual
Polarity: polarity_pos, polarity_neg
PartOfSpeech: pos_noun, pos_verb, pos_other
EventClass: event_speech_cognitive, event_grammatical, event_other
TIMEX3Type: timex3_date, timex3_time, timex3_duration, timex3_set
EntityClass: entity_class_spc, entity_class_gen, entity_class_usp,
  entity_class_neg
TIMEX3Modifier: mod_before, mod_on_or_before, mod_mid, mod_end,
  mod_after, mod_on_or_after, mod_less_than, mod_more_than,
  mod_equal_or_less, mod_equal_or_more, mod_start, mod_approx
FunctionInDocument: function_creation_time, function_expiration_time,
  function_modification_time, function_publication_time,
  function_release_time, function_reception_time, function_none

SyntacticType: syntactic_type_nam, syntactic_type_nom,
  syntactic_type_pro, syntactic_type_ptv, syntactic_type_pre,
  syntactic_type_hls, syntactic_type_conj, syntactic_type_app,
  syntactic_type_arc
EntityType: entity_type_per, entity_type_loc, entity_type_org,
  entity_type_pro, entity_type_fin, entity_type_mix
Tense: tense_future, tense_past, tense_present,
  tense_infinitive, tense_prespart, tense_pastpart, tense_none
Aspect: aspect_progressive, aspect_perfective,
  aspect_perfective_progressive, aspect_none
NAFLayer: layer_raw, layer_text, layer_terms, layer_deps,
  layer_chunks, layer_entities, layer_coreferences, layer_srl,
  layer_constituency, layer_time_expressions, layer_factuality
TLinkType: tlink_before, tlink_after, tlink_includes, tlink_measure,
  tlink_is_included, tlink_simultaneous, tlink_iafter, tlink_ibefore,
  tlink_begins, tlink_ends, tlink_begun_by, tlink_ended_by

The vocabulary namespace is http://dkm.fbk.eu/ontologies/newsreader. The suggested prefix for referencing the vocabulary is nwr:.

A list of classes and properties is reported below, with links to their reference documentation:

Resource layer

For each processed news, two resources are stored in the KnowledgeStore: (i) a News resource for the news itself, containing its metadata and, optionally, its textual content (depending on availability and copyright agreements); and (ii) a NAFDocument resource storing the NAF document generated for the news.

News are described using metadata from the Dublin Core Metadata Terms vocabulary (dct:* attributes), augmented with NewsReader-specific attributes to keep track of the external source document the news has been imported from: originalFileName, originalFileFormat, originalPages (as defined in NAF).

NAF documents are described with the subset of metadata from the NAF header that is most relevant for selecting NAF documents in the KnowledgeStore. This subset comprises: the NAF version (attribute version); the *publicId* of the NAF document (attribute dct:identifier); the NAF layers available in the NAF document, e.g., text, terms, deps (attribute layer); the NAF processors used (attribute dct:creator) and the language of the processed document (attribute dct:language); complete metadata and all the produced linguistic annotations are available in the stored XML content of the NAF document.

Mention layer

Based on the markables of WP3 annotation guidelines, four main types of mentions are formalized in this ontology: *Entity mentions*, *Relation mentions*, *Signal and CSignal mentions* and *Value mentions*; for all of them, the position of the mention in the news is encoded with numerical character offsets based on the NLP Interchange Format (NIF) vocabulary (attributes nif:beginIndex, nif:endIndex, nif:anchorOf), so to enable interoperability with tools consuming NIF data.

Entity mentions (class EntityMention) denote entities in the domain of discourse (linked with ks:refersTo). An optional localCorefID attribute can be used to group mentions coreferring within a document (intra-document coreference). Entity mentions are further characterized based on the type of entity:

- *Object mentions* (class ObjectMention) refer to persons, locations, organizations, products, financial objects (e.g., "NASDAQ Index") and mixed entities (e.g., "the CEO and his company"), discriminated via attribute entityType and enumeration EntityType; the types considered are those proposed in the revised annotation guidelines of WP3. Object mentions are described by: a syntactic head (attribute syntacticHead); a syntactic type, e.g., name, nominal or pronoun (attribute syntacticType, enumeration SyntacticType); and a linguistic entity class, e.g., specific referential (attribute entityClass, enumeration EntityClass).
- *Time mentions* (class TimeMention) are described using the subset of TIMEX3 properties selected in NAF and in the annotation guidelines. These properties include: the TIMEX3 type, e.g., date, time, duration (attribute timeType, enumeration TIMEX3Type); the normalized time value (attribute value); the function within the document, e.g., document creation time (attribute functionInDocument, enumeration FunctionInDocument); relations with other time mentions (attributes beginPoint, endPoint, anchorTime, valueFromFunction); the optional quantifier (e.g., "every"), frequency (e.g., "twice-a-month") and modifier (e.g., "approx") characterizing the expression and whether it is used as a temporal function (respectively, attributes quant, freq and mod, with corresponding enumeration TIMEX3Modifier).
- *Event mentions* (class EventMention) are characterized using a number of attributes: the linguistic class of the event, e.g., speech-cognitive (attribute eventClass, enumeration EventClass); the lemma of the token conveying the event (attribute pred); the part-of-speech (attribute pos, enumeration PartOfSpeech), e.g., adjective, noun or verb; the certainty and factuality of the event, together with a factuality confidence (attributes certainty, factuality and factualityConfidence, with enumerations Certainty and Factuality); the tense, aspect, polarity (e.g., positive) and modality (e.g., ``should") of the verbal form used (respectively, attributes tense, aspect, polarity and modality, with enumerations Tense, Aspect and Polarity). In addition, references to external resources further specifying the type of event are stored using attributes framenetRef, verbnetRef, propbankRef and nombankRef.

Relation mentions (class RelationMention) express relations between two entities, whose mentions are identified by source and target links. Different kinds of relation mentions are stored:

- *Causal links* (class CLink) express a causal relation between two events.
- *Temporal links* (class TLink) denote a certain temporal relation (attribute relType, enumeration TLinkType), e.g., before, include, simultaneous, among two events or time expressions.
- *Subordinate links* (class SLink) express certain structural relations among events.
- *GLinks* (class GLink) express grammatical relations among events, as in ``the share drop came on the same day", with ``drop" and ``came" being events.
- *Participation mentions* (class Participation) denote the participation of an entity to an event in a certain thematic role (attribute thematicRole), possibly further specified by references to external resources (attributes framenetRef, verbnetRef, propbankRef and nombankRef).

Signal and CSignal mentions (respectively, classes SignalMention and CSignalMention) identify pieces of text supporting the existence of a temporal or causal relation, to which they are linked by relations signal and csignal.

Value mentions (class ValueMention) are numerical expressions used for quantities (cardinal numbers in general), percentages and monetary expressions; the type of value is expressed by attribute valueType, enumeration ValueType.

Entity layer

Different kinds of entities are stored, including persons, organizations, geo-political entities or locations, events, points and intervals in time extracted from text; the type of entity is conveyed by an rdf:type axiom.

The context in which an axiom holds is described and identified in terms of temporal validity (attribute

sem:hasTimeValidity) and time-referenced point of view (attribute sem:hasPointOfView), e.g., ``Financial Times'' point of view expressed on 2013/12/15; the Simple Event Model (SEM) and the OWL Time vocabularies are used to that purpose.

Axiom metadata consists of a confidence value (attribute confidence), a provenance indication (attribute dct:source) and a crystallized flag (attribute crystallized). Confidence is represented on a 0.0 - 1.0 scale and quantifies how reliable an extracted statement is. Provenance is stored for background knowledge axioms and denote the external sources they have been imported from, e.g., DBPedia (note that he adoption of a provenance model to track sources, authority, and tool processing activities, is still under definition at project level). The crystallized flag is set for axioms belonging to background knowledge or assimilated to it after repeated extraction of the conveyed information, according to some crystallization algorithm.

Terms reference

Classes: | Aspect | CLink | CSignalMention | Certainty | EntityClass | EntityMention | EntityType | EventClass | EventMention | Factuality | FunctionInDocument | GLink | NAFDocument | NAFLayer | NAFProcessor | News | ObjectMention | PartOfSpeech | Participation | Polarity | RelationMention | SLink | SignalMention | SyntacticType | TIMEX3Modifier | TIMEX3Type | TLink | TLinkType | Tense | TimeMention | TimeOrEventMention | ValueMention | ValueType |

Properties: | anchorTime | annotatedWith | annotationOf | aspect | beginPoint | certainty | confidence | crystallized | csignal | endPoint | entityClass | entityType | eventClass | factuality | factualityConfidence | framenetRef | freq | functionInDocument | layer | localCorefID | mod | modality | nombankRef | originalFileFormat | originalFileName | originalPages | polarity | pos | pred | propbankRef | quant | relType | signal | source | syntacticHead | syntacticType | target | temporalFunction | tense | termID | thematicRole | timeType | value | valueFromFunction | valueType | verbnetRef | version |

Classes and Properties (full detail)

Classes

Class: nwr:Aspect

Enumeration of verb aspects.

Used with: nwr:aspect

Class: nwr:CLink

A causal link, i.e., a mention denoting a causal relation among two events.

Properties include: nwr:csignal

Sub class of   nwr:RelationMention

Restriction(s):   The property nwr:target must *have some* nwr:EventMention value(s)
The property nwr:source must *have some* nwr:EventMention value(s)

Class: nwr:CSignalMention

A piece of text supporting the existence of a causal (CLink) relation among events.

Used with: nwr:csignal

Sub class of   ks:Mention

Restriction(s): The property ks:refersTo must *have at most* 0 value(s)

Class: nwr:Certainty

Enumeration of possible types of certainty.

Used with: nwr:certainty

Class: nwr:EntityClass

Enumeration of entity classes.

Used with: nwr:entityClass

Class: nwr:EntityMention

A piece of text denoting an entity in the domain of discourse (identified by relation nwr:refersTo), such as a person, organization or location.

Properties include:	nwr:localCorefID
Used with:	nwr:source nwr:target
Sub class of	ks:Mention
Has sub class	nwr:ObjectMention nwr:TimeOrEventMention

Class: nwr:EntityType

Enumeration of entity types.

Used with: nwr:entityType

Class: nwr:EventClass

Enumeration of event classes.

Used with: nwr:eventClass

Class: nwr:EventMention

A mention of an event.

Properties include:	nwr:eventClass nwr:factuality nwr:pos nwr:pred nwr:tense nwr:factualityConfidence nwr:modality nwr:polarity nwr:certainty nwr:aspect
Sub class of	nwr:TimeOrEventMention

Class: nwr:Factuality

Enumeration of possible types of factuality.

Used with: nwr:factuality

Class: nwr:FunctionInDocument

Enumeration of possible functions of a time mention in a document.

Used with: nwr:functionInDocument

Class: nwr:GLink

A grammatical link among event mentions.

Sub class of	nwr:RelationMention
Restriction(s):	The property nwr:target must *have some* nwr:EventMention value(s) The property nwr:source must *have some* nwr:EventMention value(s)

Class: nwr:NAFDocument

The annotation of a news according to the NAF format, consisting in one or more layers of NLP annotations encoded in a standoff, XML-based format.

Properties include:	nwr:layer nwr:annotationOf
Sub class of	nfo:TextDocument ks:Resource
Restriction(s):	The property nwr:layer must *have some* nwr:NAFLayer value(s) The property dcterms:creator must *have some* nwr:NAFProcessor value(s) The property nwr:annotationOf must *have some* nwr:News value(s)

Class: nwr:NAFLayer

A NAF layer. Currently defined layers include text, terms, dependencies (deps), chunks, entities, coreferences, opinions, events and timex3 expressions.

Used with: nwr:layer

Class: nwr:NAFProcessor

An NLP module able to produce (and possibly consume) NAF contents, characterized by a name and version.

Class: nwr:News

A news article, consisting in the news plain text and associated metadata.

Used with: nwr:annotationOf

Sub class of nfo:TextDocument ks:Resource

Class: nwr:ObjectMention

A mention of an endurant object (in KR literature), such as a person, organization or location (known as 'entities' in the NLP literature).

Properties include: nwr:entityType nwr:syntacticType nwr:syntacticHead nwr:entityClass

Sub class of nwr:EntityMention

Class: nwr:PartOfSpeech

Enumeration of possible part-of-speech.

Used with: nwr:pos

Class: nwr:Participation

A mention denoting the participation of an object (e.g., a person) to a certain event, further characterized by the role played by that object.

Properties include: nwr:thematicRole

Sub class of nwr:RelationMention

Restriction(s): The property nwr:target must *have some* nwr:ObjectMention value(s)
The property nwr:source must *have some* nwr:EventMention value(s)

Class: nwr:Polarity

Enumeration of event polarities (either positive or negative).

Used with: nwr:polarity

Class: nwr:RelationMention

A piece of text expressing a relation between two entities, whose mentions are identified by nwr:source and nwr:target links).

Properties include: nwr:target nwr:source

Sub class of ks:Mention

Restriction(s): The property ks:refersTo must *have at most* 0 value(s)

Has sub class nwr:TLink nwr:CLink nwr:Participation nwr:GLink nwr:SLink

Class: nwr:SLink

A structural link, i.e., a mention denoting a structural relation among two events.

Sub class of nwr:RelationMention

Restriction(s): The property nwr:target must *have some* nwr:EventMention value(s)
The property nwr:source must *have some* nwr:EventMention value(s)

Class: nwr:SignalMention

A piece of text supporting the existence of a temporal (TLink) relation among events and/or time expressions.

Used with: nwr:signal

Sub class of ks:Mention

Restriction(s): The property ks:refersTo must *have at most* 0 value(s)

Class: nwr:SyntacticType

Enumeration of syntactic types, such as proper name (nwr:syn_nam), pronoun (nwr:syn_pro), ...

 Used with: nwr:syntacticType

Class: nwr:TIMEX3Modifier

Enumeration of possible TIMEX3 modifiers.

 Used with: nwr:mod

Class: nwr:TIMEX3Type

Enumeration of TIMEX3 temporal expression types.

 Used with: nwr:timeType

Class: nwr:TLink

A temporal link, i.e., a mention denoting a temporal relation among two events and/or time expressions.

Properties include:	nwr:signal nwr:relType
Sub class of	nwr:RelationMention
Restriction(s):	The property nwr:target must *have some* nwr:TimeOrEventMention value(s)
	The property nwr:source must *have some* nwr:TimeOrEventMention value(s)

Class: nwr:TLinkType

Enumeration of TLink types.

 Used with: nwr:relType

Class: nwr:Tense

Enumeration of verb tenses.

 Used with: nwr:tense

Class: nwr:TimeMention

A mention of a time expression.

Properties include:	nwr:freq nwr:anchorTime nwr:value nwr:mod nwr:beginPoint nwr:functionInDocument nwr:valueFromFunction nwr:timeType nwr:quant nwr:temporalFunction nwr:endPoint
Used with:	nwr:valueFromFunction nwr:beginPoint nwr:anchorTime nwr:endPoint
Sub class of	nwr:TimeOrEventMention

Class: nwr:TimeOrEventMention

Utility concept aggregating mentions of events and mentions of time expressions.

Sub class of	nwr:EntityMention
Has sub class	nwr:TimeMention nwr:EventMention

Class: nwr:ValueMention

A numerical expression denoting either a quantity (cardinal numbers in general), a percentage or a monetary value.

Properties include:	nwr:valueType
Sub class of	ks:Mention
Restriction(s):	The property ks:refersTo must *have at most* 0 value(s)

Class: nwr:ValueType

Enumeration of value types.

Used with: nwr:valueType

Properties

Property: nwr:anchorTime

Links a time mention whose time value cannot be independently determined to an anchoring mention that permits to resolve its value.

Domain: nwr:TimeMention
Range: nwr:TimeMention

Property: nwr:annotatedWith

Specifies the NAF annotation(s) associated to a news resource.

Inverse property of nwr:annotationOf

Property: nwr:annotationOf

Specifies the news resource a NAF annotation resource is associated to.

Domain: nwr:NAFDocument
Range: nwr:News
Has inverse property nwr:annotatedWith

Property: nwr:aspect

Specifies the aspect of the verb conveying the mentioned event.

Domain: nwr:EventMention
Range: nwr:Aspect

Property: nwr:beginPoint

Links a time mention denoting a time interval to the time mention denoting the beginning of that interval.

Domain: nwr:TimeMention
Range: nwr:TimeMention

Property: nwr:certainty

Specifies whether and how a mentioned event is certain.

Domain: nwr:EventMention
Range: nwr:Certainty

Property: nwr:confidence

Specifies a confidence value on a 0-1 scale.

Range: xsd:decimal

Property: nwr:crystallized

Specifies whether an axiom has been crystallized (i.e., it can be considered as background knowledge).

Domain: ks:Axiom
Range: xsd:boolean

Property: nwr:csignal

Associates a CLink mention to the CSignal mention denoting the existence of the relation.

Domain: nwr:CLink
Range: nwr:CSignalMention

Property: nwr:endPoint

Links a time mention denoting a time interval to the time mention denoting the end of that interval.

Domain: nwr:TimeMention
Range: nwr:TimeMention

Property: nwr:entityClass

Specifies the definiteness of the mentioned entity.

Domain: nwr:ObjectMention
Range: nwr:EntityClass

Property: nwr:entityType

Specifies the semantic type of the mentioned entity.

Domain: nwr:ObjectMention
Range: nwr:EntityType

Property: nwr:eventClass

Specifies the semantic type of the mentioned event.

Domain: nwr:EventMention
Range: nwr:EventClass

Property: nwr:factuality

Specifies whether and how a mentioned event is factual.

Domain: nwr:EventMention
Range: nwr:Factuality

Property: nwr:factualityConfidence

Specifies the degree of confidence in a factuality prediction.

Domain: nwr:EventMention
Range: xsd:double

Property: nwr:framenetRef

Encodes a link to a FrameNet object.

Property: nwr:freq

Used for specifying sets that denote quantified times. It contains an integer value and a time granularity to represent any frequency contained in the set. Usual values are '2X' (twice-a-month), '3D' (three-days), etc.

Domain: nwr:TimeMention
Range: xsd:string

Property: nwr:functionInDocument

Specifies the function of a time mention within the containing document (e.g., document creation date).

Domain: nwr:TimeMention
Range: nwr:FunctionInDocument

Property: nwr:layer

Specifies the NAF layers available in a NAF annotation resource

Domain: nwr:NAFDocument
Range: nwr:NAFLayer

Property: nwr:localCorefID

Specifies the ID of the intra-document coreference cluster an entity mention belongs to.

Domain: nwr:EntityMention
Range: xsd:string

Property: nwr:mod

Used for temporal modifiers that cannot be expressed either within value proper, or via links or temporal functions.

Domain: nwr:TimeMention
Range: nwr:TIMEX3Modifier

Property: nwr:modality

Conveys different degrees of modality of an event. Its value is the lemma of the modal verb modifying the main event, e.g., may (English), potere (Italian), poder (Spanish).

Domain: nwr:EventMention
Range: xsd:string

Property: nwr:nombankRef

Encodes a link to a NomBank object.

Property: nwr:originalFileFormat

The file format of the original document a News was imported from (NAF property)

Range: xsd:string

Property: nwr:originalFileName

The file name of the original document a News was imported from (NAF property)

Range: xsd:string

Property: nwr:originalPages

The number of pages of the original document a News was imported from (NAF property)

Range: xsd:int

Property: nwr:polarity

Specifies the polarity of the mentioned event.

Domain: nwr:EventMention
Range: nwr:Polarity

Property: nwr:pos

Specifies the part-of-speech for the event mention.

Domain: nwr:EventMention
Range: nwr:PartOfSpeech

Property: nwr:pred

Specifies the lemma of the token describing the event.

Domain: nwr:EventMention
Range: xsd:string

Property: nwr:propbankRef

Encodes a link to a PropBank object.

Property: nwr:quant

Used for specifying sets that denote quantified times. Generally a literal from the text that quantifies over the expression. Usual values are 'EVERY', 'SOME', etc.

Domain: nwr:TimeMention
Range: xsd:string

Property: nwr:relType

Specifies the type of TLink relation.

Domain: nwr:TLink
Range: nwr:TLinkType

Property: nwr:signal

Associates a TLink mention to the Signal mention denoting the existence of the relation.

Domain: nwr:TLink
Range: nwr:SignalMention

Property: nwr:source

Specifies the first argument of a relation mention.

Domain: nwr:RelationMention
Range: nwr:EntityMention

Property: nwr:syntacticHead

Specifies the syntactic head of a mention, which is a string contained in the mention extent.

Domain: nwr:ObjectMention
Range: xsd:string

Property: nwr:syntacticType

Specifies the syntactic category of the mention.

Domain: nwr:ObjectMention
Range: nwr:SyntacticType

Property: nwr:target

Specifies the second argument of a relation mention.

Domain: nwr:RelationMention
Range: nwr:EntityMention

Property: nwr:temporalFunction

Specifies whether a time mention is used as a temporal function.

Domain: nwr:TimeMention
Range: xsd:boolean

Property: nwr:tense

Specifies the tense of the verb conveying the mentioned event.

Domain: nwr:EventMention
Range: nwr:Tense

Property: nwr:termID

Specifies the term ID(s) that constitute a mention extent.

Domain: ks:Mention
Range: xsd:string

Property: nwr:thematicRole

Specifies the thematic role of an object in an event.

Domain: nwr:Participation

Property: nwr:timeType

Specifies the type of time expressed by a time mention.

Domain: nwr:TimeMention
Range: nwr:TIMEX3Type

Property: nwr:value

Specifies the normalized value of a temporal expression using the ISO-8601 standard.

Domain: nwr:TimeMention
Range: xsd:string

Property: nwr:valueFromFunction

Used when the value is taken from a temporal function timex3.

Domain: nwr:TimeMention
Range: nwr:TimeMention

Property: nwr:valueType

Specifies the type of value expressed by a value mention.

Domain: nwr:ValueMention
Range: nwr:ValueType

Property: nwr:verbnetRef

Encodes a link to a VerbNet object.

Property: nwr:version

Specifies the version of an artefact.

Range: xsd:string