Travelogue
Data Model
Documentation

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The European network SPACE (Supporting Performing Arts Circulation in Europe) aims to enhance data exchange and develop research on international mobility in performing arts productions. The online prototype Travelogue is an initiative of SPACE intended to use Linked Data technology to link and exchange data on international touring in the performing arts. Since each organisation has its own way of collecting and representing data, exchanging and linking this data is not an easy feat. Hence, one part of Travelogue concerns developing a common data model. This text outlines the motivation for the data model and explains the model to IT professionals who wish to work with the Travelogue datasets.

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s p a c e

supporting performing arts circulation in europe

Motivation

In recent decades, international touring and international coproductions of performing arts have been on the rise in Europe. By way of illustration: from 1999 to 2003, about a third of all Flemish stage productions were also presented outside of Belgium. For Flemish dance performances, this number was even higher at 40%. Support for the performing arts, however, still mainly comes from institutions operating at the national level such as governments, agencies, funding bodies and cultural institutions. This poses many challenges for policymaking and data collection on international activities.

It is clear that national institutions should take this international dimension into account when formulating their policies. This presupposes that these institutions do not limit their analyses to their own data but that they also include data from foreign institutions. In other words, the data of diverse European institutions needs to be linked. As a prerequisite to this, however, we need to know how different countries are presently dealing with their data. To this end, in May 2008, VTi (Flemish Institute for the Performing Arts) and IETM (Informal European Theatre Meeting) collected information on this data collection in their *Home & Away* survey.

The results of the *Home & Away* survey reveal a striking disparity in approaches between different countries. This disparity is located at various levels:

→ Type of documents: The documents vary from performance yearbooks, Eurostat statistics and research papers to simple Excel sheets, online databases and data warehouses.

→ Source of the documents: The documents' sources vary from research centres to ministries. This can have an impact on the breadth of the field covered by the data. For example, are only subsidised projects covered, or is there an attempt to cover the entire sector in the country in question?

→ Granularity: In the best case, the documents contain raw datasets that, however, can still vary with respect to the level of detail. In the worst case, the documents contain aggregate numbers only.

→ Import or export: Some institutions focus on mapping the *export* of performing arts (the performance of stage productions abroad) and dedicate less attention to *import* (the performance of a foreign stage production in the host country).

→ Database criteria: The entities in and attributes of the different datasets vary greatly. Parameters that may or may not be registered in the database include the number of productions, the number of performances of productions, companies, target countries, regions of origin, venues, audience numbers and age, and so on.

→ A quantitative or qualitative approach: For example, are reputations measured quantitatively or qualitatively?

Many of these disparities are simply the consequence of different rationales, logic, ambitions and even political colour. For example, is the data used by cultural organisations as a lobbying tool, or is it used by the government as a policy instrument? And if the region of origin of theatre companies is an important policy parameter, there is a high probability that this parameter will be included in the data, otherwise the parameter will probably be absent.

This disparity in approaches obscures our view on and understanding of the transnational dissemination of performing arts productions in Europe. Existing information cannot be compared between Member States because all are working on their own data islands. To remedy this, the Travelogue prototype aims to create links between existing databases in such a way that information is harmonised and comparable.

Linked Data as a solution

The Travelogue prototype links the existing databases from different countries using Linked Data techniques, a component of the Semantic Web. Linked Data is about using the World Wide Web to connect related data that has not been previously linked, or using the Web to lower the barriers to linking data currently linked using other methods. More specifically, Linked Data is a way of exposing, sharing and connecting pieces of data using URIs (Uniform Resource Identifier) and RDF (Resource Description Framework). This results in an open and low-threshold framework, in which browsers and search engines can connect related information from different sources.

In a W3C (World Wide Web Consortium) memo, Tim Berners-Lee describes the four principles of Linked Data:

1. The use of URIs to name entities.
2. The use of HTTP URIs to allow users to look up those names.
3. When a URI is queried, useful information should be provided using the prevailing standards (RDF, SPARQL).
4. Links to other URIs should be included, to allow the discovery of more entities.

If these rules are followed, users accessing your are able to discover other related data, which can be reused for other purposes. These rules for Linked Data are largely the same as those used on the traditional Web to interlink web pages via hyperlinks. Linked Data is to data what the World Wide Web is to web pages.

Many databases have already been published as Linked Data. Examples include Eurostat (detailed statistics on EU Member States), DBpedia (structured information from Wikipedia), GeoNames (a worldwide geographical database), MusicBrainz (a music and artist database), Project Gutenberg (literary works in the public domain), Revyu (community reviews on all possible topics) and the World Factbook (country statistics compiled by the CIA). Many of these are linked to each other. Some of the most important interlinked datasets as of September 2010 are shown in *Figure 1*:

Figure 1: *Some Linked Data datasets* (Linking Open Data cloud diagram, by Richard Cyganiak and Anja Jentzsch. http://lod-cloud.net)

As of September 2010

Under the hood, all entities in these datasets and their relationships are described by RDF statements. RDF (Resource Description Framework) provides a generic, graph-based data model to structure and link data. Each RDF "triple" has three parts: *subject – predicate – object*. Some examples:

→ William Shakespeare – born in – Stratford-upon-Avon;

→ William Shakespeare – has a child – Susanna Hall;

→ Stratford-upon-Avon – is located at latitude – 52.19.

We used names here to make the structure clear, but in reality, each subject and predicate is identified by a URI, while an object can be represented by a URI or be a *literal* value such as a string or a number. The previous examples can be found in the DBpedia database in the following form:

→ <http://dbpedia.org/resource/William_Shakespeare> <http://dbpedia.org/ontology/birthPlace> <http://dbpedia.org/resource/Stratford-upon-Avon>

→ <http://dbpedia.org/resource/William_Shakespeare> <http://dbpedia.org/ontology/child> <http://dbpedia.org/resource/Susanna_Hall>

→ <http://dbpedia.org/resource/Stratford-upon-Avon> <http://dbpedia.org/property/latitude> 52.19

Most of the time, however, people will not write out these URIs in full, but use so-called *RDF prefixes*, which are a convention to make RDF documents shorter and hence more readable. For example, if we define the prefix DBpedia as a shorter name for http://dbpedia.org/resource/, we can express the last RDF triple more succinctly as:

<dbpedia:Stratford-upon-Avon> <dbpedia:latitude> 52.19

Data from different schemas/vocabularies can be easily merged by simply including it in a single document. For example, a FOAF (Friend of a Friend) document describing a person can have an RDF statement on the person's address with a DBpedia location as object (e.g. http://dbpedia.org/resource/Berlin):

<http://richard.cyganiak.de/foaf.rdf#cygri> <http://xmlns.com/foaf/0.1/based_near> <http://dbpedia.org/resource/Berlin>

By linking the FOAF document to the DBpedia database (this is possible after all because the subjects and many objects are URIs), further information on the person's home city can be found in DBpedia such as its population or postal code. This, in a nutshell, is how Linked Data works. Pointers to background information and tutorials on Linked Data and RDF can be found in the *References* section at the end of this document.

Entities in the Travelogue data model

Since different organisations have different methods of data collection, different types of information and different levels of detail in their information, the data model for Travelogue needs a flexible structure, as depicted in *Figure 2*:

Figure 2: The data model for Travelogue

This flexible structure allows the combining of data that has been collected or stored in different ways, as we explained on page 32. However, the seeming complexity of the data model hides the fact that some of the shown entities are not needed to work with the data, are implementation details, or are subclasses of other entities. Therefore, we will not describe all entities in the same detail in this document.

The core of the data model is implemented by nine entities. A *dataset* is a collection of many *observation*s (also called "datapoints"). Observations are the key entities in the data model, as can be seen from the central point in our picture. They are associated with one dataset, one *geographic info* block, one *temporal info* block and one *artistic info* block. Objects of the latter three entities can be associated with more than one observation. Moreover, each observation object is linked to one *single observation* object, which connects all observation objects that are identical but occur multiple times. Further, geographic info objects are linked to *location* objects, which are linked to *name* objects, and each name is associated with one or more *matching* objects, which link a name to a page on DBpedia.

The rest of this document describes in detail these nine entities in the data model, explaining their properties, and listing some real-life example objects that are instances of the entities. For each entity, we list a table with the properties, their data type and a short description. Unless noted otherwise, all properties are required. When the dependencies between the properties are more complex, this will be explained in the description.

Example objects are shown in the form of RDF/XML syntax: RDF graphs expressed as XML documents. Other possible, semantically equivalent, representations are N3, RDFa and Turtle. All examples are taken directly from the Travelogue prototype database and have not (yet) been enriched with properties from other vocabularies. To work in the true spirit of Linked Data, some properties of well-known vocabularies such as Dublin Core, FOAF or DBpedia should also be included.

Throughout this document, we will use the following RDF prefixes:

Prefix	URI
rdfs	<http://www.w3.org/2000/01/rdf-schema#>
rdf	<http://www.w3.org/1999/02/22-rdf-syntax-ns#>
xsd	<http://www.w3.org/2001/XMLSchema#>
vocab	<http://rdf.arts-mobility.info/vocab/resource/>

For example, rdfs:label stands for <http://www.w3.org/2000/01/rdf-schema#label>.

Dataset

A dataset is a coherent collection of observations, e.g.:

→ the list of all foreign stage productions performed in Finland in 2007 and 2008

→ the list of all Flemish stage productions performed abroad in the period from 2000 to 2005.

Each dataset can be based on many imports, but this is irrelevant: as far as the data model is concerned, a dataset is just a list of observations, enriched with metadata describing the dataset.

A dataset has the following properties:

Property	Data type or value	Description
rdfs:label	String	A humanly readable and descriptive name for the dataset.
rdf:type	<vocab:datasets>	The RDF type of the dataset.
vocab:datasets_name	String	The name of the dataset.
vocab:datasets_id	xsd:int	The identifier of the dataset, which is a unique number among all datasets.
vocab:datasets_screen_display	String	The name of the dataset as displayed to users on the screen, which is identical to the rdfs:label property of this object.
vocab:datasets_created_at	xsd:dateTime	The date and time of the creation of the Dataset object in the database.
vocab:datasets_updated_at	xsd:dateTime	The date and time of the last update of the Dataset object in the database.
vocab:datasets_export_data	xsd:boolean	True if the dataset contains export data; false otherwise.
vocab:datasets_import_data	xsd:boolean	True if the dataset contains import data; false otherwise.
vocab:datasets_observations	vocab:observations	This property occurs multiple times: for each observation that is part of this dataset.

All these properties are required. This means that all Dataset objects essentially look the same, as in the following example.

Example
A typical dataset:

```
<rdf:RDF
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:vocab="http://rdf.arts-mobility.info/vocab/resource/"
xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">
<rdf:Description rdf:about="http://rdf.arts-mobility.info/data/datasets/sweden-2006-export">
<rdfs:label>Sweden 2006 Export</rdfs:label>
<rdf:type rdf:resource="http://rdf.arts-mobility.info/vocab/resource/datasets"/>
<vocab:datasets_screen_display>Sweden 2006 Export</vocab:datasets_screen_display>
<vocab:datasets_name>Sweden_2006_Export</vocab:datasets_name>
<vocab:datasets_id rdf:datatype="http://www.w3.org/2001/XMLSchema#int">27</vocab:datasets_id>
<vocab:datasets_created_at rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2010-09-
    22T10:45:42.447</vocab:datasets_created_at>
<vocab:datasets_updated_at rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2010-09-
    22T10:45:42.456</vocab:datasets_updated_at>
<vocab:datasets_export_data
rdf:datatype="http://www.w3.org/2001/XMLSchema#boolean">false</vocab:datasets_export_data>
<vocab:datasets_import_data
rdf:datatype="http://www.w3.org/2001/XMLSchema#boolean">false</vocab:datasets_import_data>
<vocab:datasets_observations
rdf:resource="http://rdf.arts-mobility.info/resource/observations/sweden-2006-export-2006--10"/>

...

</rdf:Description>
</rdf:RDF>
```

This example shows the dataset named "Sweden 2006 Export". The bulk of the properties are references to all observations that are part of this dataset.

Observation

An observation (also called a "datapoint") is the key entity of the data model: it assembles all the information on one specific stage production: who, what, where and when? Since not all datasets register this information with the same level of detail, different Observation objects can have different sets of properties. That is, not all properties need to be present in all Observation objects.

An Observation has the following properties:

Property	Data type or value	Description
rdfs:label	String	A humanly readable and descriptive name for the observation.
rdf:type	<vocab:observations>	The RDF type of the observation.
vocab:observations_id	xsd:int	The identifier of the observation, which is a unique number among all observations.
vocab:observations_screen_display	String	The name of the observation as it is displayed to users on the screen, which is identical to the rdfs:label property of this object.
vocab:observations_created_at	xsd:dateTime	The date and time of the creation of the Observation object in the database.
vocab:observations_updated_at	xsd:dateTime	The date and time of the last update of the Observation object in the database.
vocab:observations_host_geographic_info_id	xsd:int	The ID of the geographic location where the stage production was performed.
vocab:observations_origin_geographic_info_id	xsd:int	The ID of the geographic origin of this observation, which is the place where the observation was produced.
vocab:observations_artistic_info_id	xsd:int	The ID of the Artistic info object of this observation, representing who performed or produced it and which production it was.
vocab:observations_dataset_id	xsd:int	The ID of the dataset of which this observation is a part.
vocab:observations_temporal_info_id	xsd:int	The ID of the Temporal info object of this observation, representing when the stage production was performed.
vocab:observations_single_observation_id	xsd:int	The ID of the Single observation object connected to this observation.
vocab:observations_nr_of_performances	xsd:int	The number of performances of this observation during the time of its Temporal info object. This is an integer greater than or equal to 0. Not all Observation objects have this property, and the value 0 means that the number of performances is unknown.
vocab:observations_nr_of_days	xsd:int	The number of days this stage production was performed, which is an integer greater than or equal to 1. Not all Observation objects have this property.
vocab:observations_count_of_au diences	xsd:int	The number of people in the audience of this observation. This is an integer greater than or equal to 0. Not all Observation objects have this property, and the value 0 means that the number of persons in the audience is unknown.
vocab:observations_count_of_youth	xsd:int	The number of youngsters in the audience of this observation. This is an integer greater than or equal to 0. Not all Observation objects have this property, and the value 0 means that the number of youngsters in the audience is unknown.
vocab:observations_count_of_audiences_by_age_0_to_5	xsd:int	The number of people between the ages of 0 and 5 in the audience of this observation. Not all Observation objects have this property.
vocab:observations_count_of_audiences_by_age_6_to_15	xsd:int	The number of people between the ages of 6 and 15 in the audience of this observation. Not all Observation objects have this property.
vocab:observations_count_of_audiences_by_age_16_to_25	xsd:int	The number of people between age 16 and 25 in the audience of this observation. Not all Observation objects have this property.
vocab:observations_occupation	xsd:int	The occupation of this stage production. Not all Observation objects have this property.
vocab:observations_school_performance	xsd:boolean	A Boolean flag defining whether or not this observation concerns a school performance. Not all Observation objects have this property.
vocab:observations_nr_of_people_on_tour	xsd:int	The number of people on tour to perform this stage production. Not all Observation objects have this property.
vocab:observations_financial_variant	String	The financial variant of this stage production. Not all Observation objects have this property.
vocab:observations_notes	String	Special notes about this observation. Not all Observation objects have this property.
vocab:observations_specifics	String	Specific notes about this observation, e.g. that it was not open to the public. Not all Observation objects have this property.

If the original dataset did not register particular information about the observations, the objects lack properties like vocab:observations_nr_of_performances, vocab:observations_count_of_audiences or even vocab:observations_artistic_info_id.

The property vocab:observations_notes is only used for important information that does not fit the data model, as is vocab:observations_specifics.

Example

A typical example of an Observation object:

```
<rdf:RDF
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#" xmlns:vocab="http://rdf.arts-mobility.
    info/vocab/resource/" xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">
<rdf:Description rdf:about="http://rdf.arts-mobility.info/resource/observations/belarus-
    belarusfreetheatre-export20052009-012006--2">
<rdfs:label>Belarus Belarusfreetheatre Export20052009 01/2006</rdfs:label>
<rdf:type rdf:resource="http://rdf.arts-mobility.info/vocab/resource/observations"/>
<vocab:observations_artistic_info_id
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">5</vocab:observations_artistic
    _info_id>
<vocab:observations_screen_display>Belarus Belarusfreetheatre Export20052009
    01/2006</vocab:observations_screen_display>
<vocab:observations_created_at rdf:datatype="http://www.w3.org/2001/
    XMLSchema#dateTime">2010-09-22T10:12:33.519</vocab:observations_created_at>
<vocab:observations_updated_at rdf:datatype="http://www.w3.org/2001/
    XMLSchema#dateTime">2010-09-22T12:01:07.44</vocab:observations_updated_at>

<vocab:observations_id
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">18</vocab:observations_id>
<vocab:observations_dataset_id
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</vocab:observations_dataset_id>
<vocab:observations_host_geographic_info_id
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">11</vocab:observations_host_
    geographic_info_id>
<vocab:observations_origin_geographic_info_id
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2</vocab:observations_origin_
    geographic_info_id>
<vocab:observations_temporal_info_id
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">8</vocab:observations_temporal_info_id>
<vocab:observations_single_observation_id
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3740</vocab:observations_single_
    observation_id>
<vocab:observations_nr_of_people_on_tour
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">24</vocab:observations_nr_of_people_on_
    tour>
<vocab:observations_school_performance
rdf:datatype="http://www.w3.org/2001/XMLSchema#boolean">false</vocab:observations_
    school_performance>
</rdf:Description>
</rdf:RDF>
```

This example object speaks for itself. It has one of the optional properties, vocab:observations_nr_of_peo-ple_on_tour, and the other properties are mostly IDs that refer to other objects.

Single observation

A single observation is linked to all observations that are identical but take place multiple times. The dates of the specific stage productions are then linked to the Observation objects, but the fact that the content of all these stage productions is actually the same is described by the relationship between the Observation objects and one Single observation object.

A Single observation has the following properties:

Property	Data type or value	Description
rdfs:label	String	A humanly readable and descriptive name for the single observation.
rdf:type	<vocab:single_observations>	The RDF type of the single observation.
vocab:single_observations_id	xsd:int	The identifier of the single observation, which is a unique number among all single observations.
vocab:single_observations_title	String	The name of the single observation as displayed to users on the screen, which is identical to the rdfs:label property of this object. This property is optional.
vocab:single_observations_ creat ed_at	xsd:dateTime	The date and time of the creation of the Single observation object in the database.
vocab:single_observations_ updat ed_at	xsd:dateTime	The date and time of the last update of the Single observation object in the database.
vocab:single_observations_ period	String	The period during which this Single observation object occured, in the format "dd/mm/yyyy".
vocab:single_observations_ observations	vocab:observations	This property occurs multiple times: for each observation linked to this single observation.

Because almost all properties are required, all Single observations actually look the same. A typical example follows below.

Example

```
<rdf:RDF
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
xmlns:vocab="http://rdf.arts-mobility.info/vocab/resource/">
<rdf:Description rdf:about="http://rdf.arts-mobility.info/resource/single_observations/361»>
<rdfs:label>Ode twee, concert voor een stille drummer</rdfs:label>
<rdf:type rdf:resource=»http://rdf.arts-mobility.info/vocab/resource/single_observations»/>
<vocab:single_observations_id
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">361</vocab:single_observations_id>
<vocab:single_observations_title>Ode twee, concert voor een stille drummer</vocab:single_
    observations_title>
<vocab:single_observations_created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2010-09-22T11:59:24.947</
    vocab:single_observations_created_at>
<vocab:single_observations_updated_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2010-09-22T11:59:24.947</
    vocab:single_observations_updated_at>
<vocab:single_observations_period>9/11/2006</vocab:single_observations_period>
<vocab:single_observations_observations
rdf:resource="http://rdf.arts-mobility.info/resource/observations/netherlands-export-
    napk-09112006--7"/>
<vocab:single_observations_observations rdf:resource="http://rdf.arts-mobility.info/resource/
    observations/netherlands-export-napk-09112006--8"/>
</rdf:Description>
</rdf:RDF>
```

This example object speaks for itself. It has all possible properties and refers to two Observation objects. You will note that these objects are linked to Temporal info objects that specify a different start time on the same date, which is specified in the Single observation object in the single_observations_period property.

Temporal info

A Temporal info object represents a time that can be granular to different levels: a date, a month, a year, a season or a generic time span from one particular date to another. For example, a date is represented as a time span with identical start and end date. Because of these varying levels of granularity, not all properties need to be present in all Temporal info objects.

Temporal info has the following properties:

Property	Data type or value	Description
rdfs:label	String	A humanly readable name for this Temporal info object. For a season, this is in the form "yyyy/zzzz", for a year "yyyy", for a month "mm/yyyy", for a date "dd/mm/yyyy", and for a generic time span in the form "dd – ee/mm/yyyy", "dd/mm – ee/nn/yyyy" or "dd/mm/yyyy – ee/nn/zzzz".
rdf:type	<vocab:temporal_infos>	The RDF type of the Temporal info object.
vocab:temporal_infos_screen_display	String	The name of the Temporal info object as displayed to users on the screen, which is identical to the rdfs:label property of this object.
vocab:temporal_infos_id	xsd:int	The identifier of the Temporal info object, which is a unique number among all Temporal info objects.
vocab:temporal_infos_created_at	xsd:dateTime	The date and time of the creation of the Temporal info object in the database.
vocab:temporal_infos_updated_at	xsd:dateTime	The date and time of the last update of the Temporal info object in the database.
vocab:temporal_infos_start_at	String	The time of day at which the Temporal info object starts, in the format "hh:mm".
vocab:temporal_infos_day	xsd:int	The day the time span starts. This must be a number from 1 to 31 that is a valid day in the month vocab:temporal_infos_month of the year vocab:temporal_infos_year. This property is present if and only if the property vocab:temporal_infos_end_day is present. Moreover, if this property is present, the property vocab:temporal_infos_month also must be present. Not all Temporal info objects have this property.
vocab:temporal_infos_end_day	xsd:int	The day the time span ends. This must be a number from 1 to 31 that is a valid day in the month vocab:temporal_infos_end_ of the year vocab:temporal_infos_end_year. This property is present if and only if the property vocab:temporal_infos_day is present. Not all Temporal info objects have this property.
vocab:temporal_infos_month	xsd:int	The month the time span begins. This must be a number from 1 to 12. This property is present if and only if the property vocab:temporal_infos_end_month is present. Moreover, if this property is present, the property vocab:temporal_infos_year also must be present. Not all Temporal info objects have this property.

vocab:temporal_infos_end_month	xsd:int	The month the time span ends. This must be a number from 1 to 12. This property is present if and only if the property vocab:temporal_infos_month is present. Not all Temporal info objects have this property.
vocab:temporal_infos_year	xsd:int	The starting year of the time span. This property is present if and only if the property vocab:temporal_infos_end_y ear is present. Not all Temporal info objects have this property.
vocab:temporal_infos_end_year	xsd:int	The ending year of the time span. This property is present if and only if the property vocab:temporal_infos_year is present. Not all Temporal info objects have this property.
vocab:temporal_infos_season	String	The season of this time span, e.g. "2002-2003". This is a much less descriptive property than the others. This property is present if and only if the day, month and year properties (start and end) are not present. Not all Temporal info objects have this property.
vocab:temporal_infos_observations	vocab:observations	This property can occur multiple times: for each observation that takes place in this time span.

Because almost none of the properties in the Temporal info object are required, and many of them depend on the presence of others, Temporal info objects can vary greatly. However, as the description of these properties shows, there are some strict rules. For example, the day, month and year properties always come in pairs: vocab:temporal_infos_day and vocab:temporal_infos_end_day, vocab:temporal_infos_month and vocab:temporal_infos_end_month, and vocab:temporal_infos_year and vocab:temporal_infos_end_year. Moreover, these properties occur in a dependency chain: if vocab:temporal_infos_day is present, vocab:temporal_infos_month also must be present, and the latter in turn requires vocab:temporal_infos_year to be present. In addition, all these properties are incompatible with the property vocab:temporal_infos_season. Thanks to these rules, there are actually just a few types of Temporal info objects, and we give an example of each below.

Example: A season

```
<rdf:RDF
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:vocab="http://rdf.arts-mobility.info/vocab/resource/"
xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">
<rdf:Description rdf:about="http://rdf.arts-mobility.info/resource/temporal_infos/2007-2008»>
<rdf:type rdf:resource=»http://rdf.arts-mobility.info/vocab/resource/temporal_infos»/>
<rdfs:label>2007-2008</rdfs:label>
<vocab:temporal_infos_screen_display>2007-2008</vocab:temporal_infos_screen_display>
<vocab:temporal_infos_id
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">435</vocab:temporal_infos_id>
<vocab:temporal_infos_created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2010-09-22T10:15:25.712</
    vocab:temporal_infos_created_at>
<vocab:temporal_infos_updated_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2010-09-22T10:15:25.719</
    vocab:temporal_infos_updated_at>
<vocab:temporal_infos_season>2007-2008</vocab:temporal_infos_year>
<vocab:temporal_infos_observations
rdf:resource="http://rdf.arts-mobility.info/resource/observations/denmark-
    childrenstheatreexport-1999to2008-2007-2008"/>

...

</rdf:Description>
</rdf:RDF>
```

This Temporal info object represents the season 2007-2008. Note that it has none of the properties describing a start or end day, month or year. The bulk of the properties are references to all observations that take place in this season.

Example: A year

```
<rdf:RDF
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:vocab="http://rdf.arts-mobility.info/vocab/resource/"
xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">
<rdf:Description rdf:about="http://rdf.arts-mobility.info/resource/temporal_infos/2008»
<rdf:type rdf:resource=»http://rdf.arts-mobility.info/vocab/resource/temporal_infos»/>
<rdfs:label>2008</rdfs:label>
<vocab:temporal_infos_screen_display>2008</vocab:temporal_infos_screen_display>
<vocab:temporal_infos_id
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">100</vocab:temporal_infos_id>
<vocab:temporal_infos_created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2010-09-22T10:13:09.062</
    vocab:temporal_infos_created_at>
<vocab:temporal_infos_updated_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2010-09-22T10:13:09.07</
    vocab:temporal_infos_updated_at>
<vocab:temporal_infos_year
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2008</vocab:temporal_infos_year>
<vocab:temporal_infos_end_year
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2008</vocab:temporal_infos_end_year>
<vocab:temporal_infos_observations
rdf:resource="http://rdf.arts-mobility.info/resource/observations/estonia-export-
    2006to2008-2008--10"/>

...

</rdf:Description>
</rdf:RDF>
```

This Temporal info object represents the year 2008. Note that both vocab:temporal_infos_year and vocab:temporal_infos_end_year are present, and their values are identical. A year thus is represented by a time span with an identical start year and end year. The bulk of the properties are references to all observations that take place in this year.

Example: A month

```
<rdf:RDF
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#" xmlns:vocab="http://rdf.arts-mobility.
    info/vocab/resource/" xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">
<rdf:Description rdf:about="http://rdf.arts-mobility.info/resource/temporal_infos/012006»
<rdf:type rdf:resource=»http://rdf.arts-mobility.info/vocab/resource/temporal_infos»/>
<rdfs:label>01/2006</rdfs:label>
<vocab:temporal_infos_screen_display>01/2006</vocab:temporal_infos_screen_display>
<vocab:temporal_infos_id rdf:datatype="http://www.w3.org/2001/XMLSchema#int">8</
    vocab:temporal_infos_id>
<vocab:temporal_infos_created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2010-09-22T10:12:33.245</
    vocab:temporal_infos_created_at>
<vocab:temporal_infos_updated_at rdf:datatype="http://www.w3.org/2001/
    XMLSchema#dateTime">2010-09-22T10:12:33.252</vocab:temporal_infos_updated_at>
<vocab:temporal_infos_month rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</
    vocab:temporal_infos_year>
<vocab:temporal_infos_end_month
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</vocab:temporal_infos_end_year>
<vocab:temporal_infos_year rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2006</
    vocab:temporal_infos_year>
<vocab:temporal_infos_end_year
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2006</vocab:temporal_infos_end_year>
<vocab:temporal_infos_observations rdf:resource="http://rdf.arts-mobility.info/resource/
    observations/belarus-belarusfreetheatre-export20052009-012006"/>

...

</rdf:Description>
</rdf:RDF>
```

This Temporal info object represents the month of January 2006. Note that both vocab:temporal_infos_year and vocab:temporal_infos_end_year are present, and they have identical values. The same holds for vocab:temporal_infos_month and vocab:temporal_infos_end_month. A month thus is represented by a time span with an identical start month and end month, and an identical start year and end year. The bulk of the properties are references to all observations that take place in this month.

Example: A generic time span

```
<rdf:RDF
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:vocab="http://rdf.arts-mobility.info/vocab/resource/"
xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">
<rdf:Description rdf:about="http://rdf.arts-mobility.info/resource/temporal_
    infos/1403-07042007»>
<rdf:type rdf:resource=»http://rdf.arts-mobility.info/vocab/resource/temporal_infos»/>
<rdfs:label>14/03 - 07/04/2007</rdfs:label>
<vocab:temporal_infos_screen_display>14/03 -07/04/2007</vocab:temporal_infos_screen_display>
<vocab:temporal_infos_id
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">299</vocab:temporal_infos_id>
<vocab:temporal_infos_created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2010-09-22T10:14:22.836</
    vocab:temporal_infos_created_at>
<vocab:temporal_infos_updated_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2010-09-22T10:14:22.844</
    vocab:temporal_infos_updated_at>
<vocab:temporal_infos_day
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">14</vocab:temporal_infos_year>
<vocab:temporal_infos_end_day
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">7</vocab:temporal_infos_end_year>
<vocab:temporal_infos_month
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3</vocab:temporal_infos_year>
<vocab:temporal_infos_end_month
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">4</vocab:temporal_infos_end_year>
<vocab:temporal_infos_year
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2007</vocab:temporal_infos_year>
<vocab:temporal_infos_end_year
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2007</vocab:temporal_infos_end_year>
<vocab:temporal_infos_observations
rdf:resource="http://rdf.arts-mobility.info/resource/observations/ireland-
    irishartistsabroad-20052009-1403-07042007"/>
</rdf:Description>
</rdf:RDF>
```

This Temporal info object represents the period from March 14, 2007 to April 7, 2007. Note that the value of the rdfs:label property has the short form "dd/mm – ee/nn/yyyy". If the start day had the value 3 and the start month the value 4, the rdfs:label property would have the even shorter form "03 – 07/04/2007" because both start month and end month and start year and end year are identical. In this example, there is one reference to an observation that takes place in this time span.

Example: A date

```
<rdf:RDF
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#" xmlns:vocab="http://rdf.arts-mobility.
    info/vocab/resource/" xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">
<rdf:Description rdf:about="http://rdf.arts-mobility.info/resource/temporal_infos/01102004»>
<rdf:type rdf:resource=»http://rdf.arts-mobility.info/vocab/resource/temporal_infos»/>
<rdfs:label>01/10/2004</rdfs:label>
<vocab:temporal_infos_screen_display>01/10/2004</vocab:temporal_infos_screen_display>
<vocab:temporal_infos_id rdf:datatype="http://www.w3.org/2001/XMLSchema#int">5291</
    vocab:temporal_infos_id>
<vocab:temporal_infos_created_at rdf:datatype="http://www.w3.org/2001/
    XMLSchema#dateTime">2010-09-22T10:55:19.128</vocab:temporal_infos_created_at>
<vocab:temporal_infos_updated_at rdf:datatype="http://www.w3.org/2001/
    XMLSchema#dateTime">2010-09-22T10:55:19.136</vocab:temporal_infos_updated_at>
<vocab:temporal_infos_day rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</
    vocab:temporal_infos_year>
<vocab:temporal_infos_end_day rdf:datatype="http://www.w3.org/2001/XMLSchema#int">1</
    vocab:temporal_infos_end_year>
<vocab:temporal_infos_month
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">10</vocab:temporal_infos_year>
<vocab:temporal_infos_end_month rdf:datatype="http://www.w3.org/2001/XMLSchema#int">10</
    vocab:temporal_infos_end_year>
<vocab:temporal_infos_year rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2004</
    vocab:temporal_infos_year>
<vocab:temporal_infos_end_year
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2004</vocab:temporal_infos_end_year>

<vocab:temporal_infos_observations rdf:resource="http://rdf.arts-mobility.info/resource/
    observations/belgium-flemish-export-2000-2005-01102004"/>


…

</rdf:Description>
</rdf:RDF>
```

This Temporal info object represents the date October 1 2004. Note that both vocab:temporal_infos_year and vocab:temporal_infos_end_year are present, and they have identical values. The same holds for vocab:temporal_infos_month and vocab:temporal_infos_end_month, as well as for vocab:temporal_infos_day and vocab:temporal_infos_end_day. So essentially, a date is represented as a time span with identical start and end day, month and year. The bulk of the properties in this example are references to all observations that take place on this date.

Example: A time

```
<rdf:RDF
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:vocab="http://rdf.arts-mobility.info/vocab/resource/"
xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">
<rdf:Description rdf:about="http://rdf.arts-mobility.info/resource/temporal_
    infos/09112006--6»>
<rdf:type rdf:resource=»http://rdf.arts-mobility.info/vocab/resource/temporal_infos»/>
<rdfs:label>09/11/2006</rdfs:label>
<vocab:temporal_infos_screen_display>09/11/2006</vocab:temporal_infos_screen_display>
<vocab:temporal_infos_id rdf:datatype="http://www.w3.org/2001/XMLSchema#int">4132</
    vocab:temporal_infos_id>
<vocab:temporal_infos_created_at rdf:datatype="http://www.w3.org/2001/
    XMLSchema#dateTime">2010-09-22T10:52:05.017</vocab:temporal_infos_created_at>
<vocab:temporal_infos_updated_at rdf:datatype="http://www.w3.org/2001/
    XMLSchema#dateTime">2010-09-22T10:52:05.027</vocab:temporal_infos_updated_at>
<vocab:temporal_infos_day rdf:datatype=»http://www.w3.org/2001/XMLSchema#int»>9</
    vocab:temporal_infos_day>
<vocab:temporal_infos_end_day
rdf:datatype=»http://www.w3.org/2001/XMLSchema#int»>9</vocab:temporal_infos_end_day>
<vocab:temporal_infos_month
rdf:datatype=»http://www.w3.org/2001/XMLSchema#int»>11</vocab:temporal_infos_month>
<vocab:temporal_infos_end_month
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">11</vocab:temporal_infos_end_month>
<vocab:temporal_infos_year
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2006</vocab:temporal_infos_year>
<vocab:temporal_infos_end_year
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">2006</vocab:temporal_infos_end_year>

<vocab:temporal_infos_start_at>14:00</vocab:temporal_infos_start_at>
<vocab:temporal_infos_observations
rdf:resource="http://rdf.arts-mobility.info/resource/observations/netherlands-export-
    napk-09112006--8"/>
</rdf:Description>
</rdf:RDF>
```

This Temporal info object represents the time November 9, 2006 at 14:00, which is the start time of one observation. The only difference with a date is the added property vocab:temporal_infos_start_at.

Geographic info

A Geographic info object represents a location. The granularity of this location can vary greatly from a specific venue to an entire country. Because of this granularity, a Geographic info object links to one or more Location objects of different types, and many of the properties are optional.

Geographic info has the following properties:

Property	Data type or value	Description
rdfs:label	String	A humanly readable name for the Geographic info object.
rdf:type	<vocab:geographic_ infos>	The RDF type of the Geographic info object.
vocab:geographic_infos_screen_display	String	The name of the Geographic info object as displayed to users on the screen, which is identical to the rdfs:label property of this object.
vocab:geographic_infos_id	xsd:int	The identifier of the Geographic info object, which is a unique number among all Geographic info objects.
vocab:geographic_infos_created_at	xsd:dateTime	The date and time of the creation of the Geographic info object in the database.
vocab:geographic_infos_updated_at	xsd:dateTime	The date and time of the last update of the Geographic info object in the database.
vocab:geographic_infos_venue	String	The name of the venue. Not all Geographic info objects have this property.
vocab:geographic_infos_website	String	The website of the Geographic info object, e.g. the website of the festival. Not all Geographic info objects have this property.
vocab:geographic_infos_festival	String	The name of the festival, if this object refers to a festival location. Not all Geographic info objects have this property.
vocab:geographic_infos_continent	String	The name of the continent of this location. Not all Geographic info objects have this property.

vocab:geographic_infos_host_ ob servations	vocab:observations	An observation that was performed at this location. This property can occur multiple times.
vocab:geographic_infos_origin_ observations	vocab:observations	An observation that was produced at this location. This property can oc-cur multiple times.
vocab:geographic_infos_locations	vocab:locations	The location of this Geographic info object. This property can occur mul-tiple times, for example to link the Geographic info object to locations of different granularity, such as one location with the city and one loca-tion with the country.
is vocab:locations_geographic_infos of	vocab:locations	The location of this Geographic info object. This property can occur mul-tiple times, for example to link the Geographic info object to locations of different granularity, such as one location with the city and one loca-tion with the country.

Because almost none of the properties in the Geographic info entity are required, a location can be expressed in different levels of granularity. Here are some examples of the main types of Geographic info objects.

Example: A generic location

```
<rdf:RDF
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:vocab="http://rdf.arts-mobility.info/vocab/resource/"
xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">
<rdf:Description rdf:about="http://rdf.arts-mobility.info/resource/geographic_infos/arad-
    romania">

<vocab:geographic_infos_id
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">3732</vocab:geographic_infos_id>
<rdf:type rdf:resource="http://rdf.arts-mobility.info/vocab/resource/geographic_infos"/>
<rdfs:label>Arad, România</rdfs:label>
<vocab:geographic_infos_screen_display>Arad, România</vocab:geographic_infos_screen_display>
<vocab:geographic_infos_created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2010-09-22T10:23:20.285</
    vocab:geographic_infos_created_at>
<vocab:geographic_infos_updated_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2010-09-22T10:23:20.315</
    vocab:geographic_infos_updated_at>
<vocab:geographic_infos_host_observations
rdf:resource="http://rdf.arts-mobility.info/resource/observations/finland-theatreexport-
    all-2007--33"/>
<vocab:geographic_infos_host_observations
rdf:resource="http://rdf.arts-mobility.info/resource/observations/finland-theatreexport-
    all-2007--34"/>
<vocab:geographic_infos_origin_observations
rdf:resource="http://rdf.arts-mobility.info/resource/observations/hungary-20052008
    import-2007--128"/>
<vocab:geographic_infos_locations rdf:resource="http://rdf.arts-mobility.info/resource/
    locations/arad"/>
<vocab:geographic_infos_locations rdf:resource="http://rdf.arts-mobility.info/resource/
    locations/romania"/>
</rdf:Description>
<rdf:Description rdf:about="http://rdf.arts-mobility.info/resource/locations/arad">
<vocab:locations_geographic_infos
rdf:resource="http://rdf.arts-mobility.info/resource/geographic_infos/arad-romania"/>
</rdf:Description>
<rdf:Description rdf:about="http://rdf.arts-mobility.info/resource/locations/romania">
<vocab:locations_geographic_infos
rdf:resource="http://rdf.arts-mobility.info/resource/geographic_infos/arad-romania"/>
</rdf:Description>
</rdf:RDF>
```

This Geographic info object represents the city of Arad in Romania. Two observations were performed at this location and one observation was produced here. The Geographic info object is linked to two locations: Arad and Romania.

Example: A venue

```
<rdf:RDF
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:vocab="http://rdf.arts-mobility.info/vocab/resource/"
xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">
<rdf:Description rdf:about="http://rdf.arts-mobility.info/resource/geographic_infos/
    t-speelhuis-helmond-nederland">
<rdf:type rdf:resource="http://rdf.arts-mobility.info/vocab/resource/geographic_infos"/>
<rdfs:label>'t Speelhuis, Helmond, Nederland</rdfs:label>
<vocab:geographic_infos_screen_display>'t Speelhuis, Helmond, Nederland</vocab:geographic_
    infos_screen_display>

<vocab:geographic_infos_id
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">10544</vocab:geographic_infos_id>
<vocab:geographic_infos_created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2010-09-22T10:57:01.239</
    vocab:geographic_infos_created_at>
<vocab:geographic_infos_updated_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2010-09-22T10:57:01.265</
    vocab:geographic_infos_updated_at>
<vocab:geographic_infos_venue>'t Speelhuis</vocab:geographic_infos_venue>
<vocab:geographic_infos_host_observations
rdf:resource=»http://rdf.arts-mobility.info/resource/observations/belgium-flemish-
    export-2000-2005-06032004--10»/>
<vocab:geographic_infos_host_observations
rdf:resource=»http://rdf.arts-mobility.info/resource/observations/belgium-flemish-
    export-2000-2005-16012002--6»/>
<vocab:geographic_infos_host_observations
rdf:resource=»http://rdf.arts-mobility.info/resource/observations/belgium-flemish-
    export-2000-2005-17012002--2»/>
<vocab:geographic_infos_host_observations
rdf:resource=»http://rdf.arts-mobility.info/resource/observations/belgium-flemish-
    export-2000-2005-24102003»/>
<vocab:geographic_infos_host_observations
rdf:resource=»http://rdf.arts-mobility.info/resource/observations/belgium-flemish-
    export-2000-2005-29032001--5»/>
<vocab:geographic_infos_locations
rdf:resource=»http://rdf.arts-mobility.info/resource/locations/helmond»/>
<vocab:geographic_infos_locations
rdf:resource=»http://rdf.arts-mobility.info/resource/locations/nederland»/>
</rdf:Description>
<rdf:Description rdf:about=»http://rdf.arts-mobility.info/resource/locations/nederland»>
<vocab:locations_geographic_infos
rdf:resource=»http://rdf.arts-mobility.info/resource/geographic_infos/t-speelhuis-helmond-
    nederland»/>
</rdf:Description>
<rdf:Description rdf:about=»http://rdf.arts-mobility.info/resource/locations/helmond»>
<vocab:locations_geographic_infos
rdf:resource=»http://rdf.arts-mobility.info/resource/geographic_infos/t-speelhuis-helmond-
    nederland»/>
</rdf:Description>
</rdf:RDF>
```

This Geographic info object represents the venue *'t Speelhuis* in the city of Helmond in the Netherlands. It looks like a generic location: a number of observations were performed here, and it is linked to two locations: Helmond and the Netherlands. The only difference is an added property vocab:geographic_infos_venue with the name of the venue. If the original database had mentioned the website of *'t Speelhuis*, the property vocab:geographic_infos_website would also be present.

Example: A festival

```
<rdf:RDF
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#" xmlns:vocab="http://rdf.arts-mobility.
    info/vocab/resource/" xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">

<rdf:Description
rdf:about="http://rdf.arts-mobility.info/resource/geographic_infos/antigonish-festival-nova-
    scotia-canada">
<vocab:geographic_infos_id
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">766</vocab:geographic_infos_id >
<rdf:type rdf:resource="http://rdf.arts-mobility.info/vocab/resource/geographic_infos"/>
<rdfs:label>Antigonish Festival, Nova Scotia, Canada</rdfs:label>
<vocab:geographic_infos_screen_display>Antigonish Festival, Nova Scotia, Canada</
    vocab:geographic_infos_screen_display>
<vocab:geographic_infos_created_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2010-09-22T10:14:47.978</
    vocab:geographic_infos_created_at>
<vocab:geographic_infos_updated_at
rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2010-09-22T10:14:48.004</
    vocab:geographic_infos_updated_at>
<vocab:geographic_infos_festival>Antigonish
Festival</vocab:geographic_infos_festival>
<vocab:geographic_infos_website>www.festivalantigonish.com</vocab:geographic_infos_website>
<vocab:geographic_infos_host_observations rdf:resource="http://rdf.arts-mobility.info/
    resource/observations/ireland-irishartistsabroad-20052009-13-16082008"/>
<vocab:geographic_infos_locations
rdf:resource="http://rdf.arts-mobility.info/resource/locations/canada"/>
<vocab:geographic_infos_locations
rdf:resource="http://rdf.arts-mobility.info/resource/locations/nova-scotia"/>
</rdf:Description>
<rdf:Description rdf:about="http://rdf.arts-mobility.info/resource/locations/nova-scotia">
<vocab:locations_geographic_infos rdf:resource="http://rdf.arts-mobility.info/resource/
    geographic_infos/antigonish-festival-nova-scotia-canada"/>
</rdf:Description>
<rdf:Description rdf:about="http://rdf.arts-mobility.info/resource/locations/canada">
<vocab:locations_geographic_infos rdf:resource="http://rdf.arts-mobility.info/resource/
    geographic_infos/antigonish-festival-nova-scotia-canada"/>
</rdf:Description>
</rdf:RDF>
```

This Geographic info object represents the *Antigonish Festival*, which takes place in Nova Scotia in Canada. If the festival had taken place at a specific venue, the object would also have a property vocab:geographic_infos_venue. The festival has a website, which is listed in the property vocab:geographic_infos_website. The object links to two locations (Nova Scotia and Canada) and it is the host of one observation.

Location

A location represents a specific type of place, for example a city or a country. Location has the following properties:

Property	Data type or value	Description
rdfs:label	String	A humanly readable name for the location.
rdf:type	<vocab:locations>	The RDF type of the location.
vocab:locations_id	xsd:int	The identifier of the location, which is a unique number among all Location objects.
vocab:locations_name	String	The name of the location, which is identical to the rdfs:label property of this object.
vocab:locations_type	String	The type of location. Possible values for this property are "City" and "Country".
vocab:locations_created_at	xsd:dateTime	The date and time of the creation of the Location object in the database.
vocab:locations_updated_at	xsd:dateTime	The date and time of the last update of the Location object in the database.
vocab:locations_geographic_infos	vocab:geographic_infos	A Geographic info object that is located at this location. This property can occur multiple times.
is vocab:geographic_infos_locations of	vocab:geographic_infos	A Geographic info object that is located at this location. This property can occur multiple times.

The two main types of locations are city and country, depending on the value of the property vocab:locations_type.

```
<rdf:RDF
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:vocab="http://rdf.arts-mobility.info/vocab/resource/"
xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">
<rdf:Description rdf:about="http://rdf.arts-mobility.info/resource/locations/france»
<rdf:type rdf:resource=»http://rdf.arts-mobility.info/vocab/resource/locations»/>
<vocab:locations_id
rdf:datatype=»http://www.w3.org/2001/XMLSchema#int»>633</vocab:locations_id>
<rdfs:label>France</rdfs
<vocab:locations_name>France</vocab:locations_name>
<vocab:locations_type>Country</vocab:locations_type>:label>

<vocab:locations_created_at rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2010-
    05-28T07:16:46.169</vocab:locations_created_at>
<vocab:locations_updated_at rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2010-
    09-22T13:10:46.222</vocab:locations_updated_at>
<vocab:locations_geographic_infos rdf:resource="http://rdf.arts-mobility.info/resource/
    geographic_infos/21st-festival-of-european-youth-theatre-grenoble-france"/>

...

</rdf:Description>
<rdf:Description rdf:about="http://rdf.arts-mobility.info/resource/geographic_infos/grenoble-
    france">
<vocab:geographic_infos_locations rdf:resource="http://rdf.arts-mobility.info/resource/
    locations/france"/>
</rdf:Description>

...

</rdf:RDF>
```

This Location object represents the country France, which is indicated by the value "Country" of the property vocab:locations_type. It is linked to many Geographic info objects, all of which are located in France.

Example: A city

```
<rdf:RDF
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#" xmlns:vocab="http://rdf.arts-mobility.
    info/vocab/resource/" xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">
<rdf:Description rdf:about="http://rdf.arts-mobility.info/resource/locations/bordeaux»>
<rdf:type rdf:resource=»http://rdf.arts-mobility.info/vocab/resource/locations»/>
<vocab:locations_id rdf:datatype=»http://www.w3.org/2001/XMLSchema#int»>86667</
    vocab:locations_id>
<rdfs:label>Bordeaux</rdfs
<vocab:locations_name>Bordeaux</vocab:locations_name>
<vocab:locations_type>City</vocab:locations_type>:label>
<vocab:locations_created_at rdf:datatype=»http://www.w3.org/2001/XMLSchema#dateTime»>2010-
    05-28T08:04:44.511</vocab:locations_created_at>
<vocab:locations_updated_at rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2010-
    09-22T13:15:53.801</vocab:locations_updated_at>
<vocab:locations_geographic_infos rdf:resource="http://rdf.arts-mobility.info/resource/
    geographic_infos/theatre-national-de-bordeaux-en-aquitaine-bordeaux-france»/>

...

</rdf:Description>
<rdf:Description rdf:about=»http://rdf.arts-mobility.info/resource/geographic_infos/theatre-
    national-de-bordeaux-en-aquitaine-bordeaux-france»>
<vocab:geographic_infos_locations rdf:resource=»http://rdf.arts-mobility.info/resource/
    locations/bordeaux"/>
</rdf:Description>

...

</rdf:RDF>
```

This Location object represents the city of Bordeaux in France, which is indicated by the value "City" in the property vocab:locations_type. It is linked to a number of Geographic info objects, all of which are located in Bordeaux.

Artistic info

An Artistic info object represents a performance and includes references to persons that are responsible for the performance such as artists and producers.

Artistic info has the following properties:

Property	Data type or value	Description
rdfs:label	String	A humanly readable and descriptive name for the artistic info.
rdf:type	<vocab:artistic_infos>	The RDF type of the artistic info.
vocab:artistic_infos_screen_display	String	The name of the artistic info as displayed to users on the screen, which is identical to the rdfs:label property of this object.
vocab:artistic_infos_id	xsd:int	The identifier of the artistic info, which is a unique number among all Artistic info objects.
vocab:artistic_infos_created_at	xsd:dateTime	The date and time of the creation of the Artistic info object in the database.
vocab:artistic_infos_updated_at	xsd:dateTime	The date and time of the last update of the Artistic info object in the database.
vocab:artistic_infos_production_type	String	The type of production for this Artistic info object, e.g. "performance", "play", "theatre", "opera", and so on. Not all Artistic info objects have this property.
vocab:artistic_infos_genre	String	The genre of this Artistic info object, e.g. "dance", "musical", "theatre", "opera", and so on. Not all Artistic info objects have this property.
vocab:artistic_infos_show_title	String	The title of the performance. Not all Artistic info objects have this property.
vocab:artistic_infos_names	vocab:names	A name of one of the persons responsible for the performance, such as the artist or producer. Not all Artistic info objects have this property, and an Artistic info object can have several of these properties, e.g. one for each artist and one for the producer.
vocab:artistic_infos_website	String	The website of this Artistic info object, e.g. the website of the artist. Not all Artistic info objects have this property.
vocab:artistic_infos_institution_type	String	The type of institution of this Artistic info object. Not all Artistic info objects have this property. Examples include "state theatre" or "independent theatre".
vocab:artistic_infos_observations	vocab:observations	This property can occur multiple times: for each observation where the performance took place.

Almost none of the properties in the Artistic info entity are required, so this information can be expressed with different levels of detail. Most of the properties speak for themselves, so we will not give examples of each. The following is a typical example.

Example: A performance with a website

```
<rdf:RDF
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:vocab="http://rdf.arts-mobility.info/vocab/resource/"
xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">
<rdf:Description rdf:about="http://rdf.arts-mobility.info/resource/artistic_infos/0-zero-
    michael-clark-company»>
<vocab:artistic_infos_id
rdf:datatype=»http://www.w3.org/2001/XMLSchema#int»>5329</vocab:artistic_infos_id>
<rdf:type rdf:resource=»http://rdf.arts-mobility.info/vocab/resource/artistic_infos"/>
<rdfs:label>0 [Zero], Michael Clark Company</rdfs:label>
<vocab:artistic_infos_screen_display>0 [Zero], Michael Clark
Company</vocab:artistic_infos_screen_display>
<vocab:artistic_infos_created_at rdf:datatype="http://www.w3.org/2001/
    XMLSchema#dateTime">2010-09-22T10:46:19.471</vocab:artistic_infos_created_at>
<vocab:artistic_infos_updated_at rdf:datatype="http://www.w3.org/2001/
    XMLSchema#dateTime">2010-09-22T11:39:22.257</vocab:artistic_infos_updated_at>
<vocab:artistic_infos_show_title>0 [Zero]</vocab:artistic_infos_show_title>
<vocab:artistic_infos_website>http://www.michaelclarkcompany.com/</vocab:artis tic_infos_
    website>
<vocab:artistic_infos_names rdf:resource="http://rdf.arts-mobility.info/resource/names/igor-
    strawinski"/>
<vocab:artistic_infos_names rdf:resource="http://rdf.arts-mobility.info/resource/names/
    michael-clark-company"/>
<vocab:artistic_infos_names rdf:resource="http://rdf.arts-mobility.info/resource/names/
    michael-clark"/>
<vocab:artistic_infos_observations rdf:resource="http://rdf.arts-mobility.info/resource/
    observations/poland-warsaw-th-inst-import-2005-2009-15-17112005"/>
</rdf:Description>
<rdf:Description rdf:about="http://rdf.arts-mobility.info/resource/observations/poland-
    warsaw-th-inst-import-2005-2009-15-17112005">
<vocab:observations_artistic_info rdf:resource="http://rdf.arts-mobility.info/resource/
    artistic_infos/0-zero-michael-clark-company"/>
</rdf:Description>
</rdf:RDF>
```

This Artistic info object represents the performance titled *O [Zero]* (which is named by the property vocab:artistic_infos_show_title) of the Michael Clark Company. It has a website (vocab:artistic_infos_website), it is the Artistic info object of one observation and it refers to three names: Igor Stravinsky (the composer), Michael Clark (the choreographer) and Michael Clark Company (the production company). The Artistic info object could store more information in additional properties like vocab:artistic_infos_production_type, vocab:artistic_infos_institution_type or vocab:artistic_infos_genre.

Name

A Name object represents the name and role of a person who is responsible for an Artistic info object, such as an artist or producer.

Name has the following properties:

Property	Data type or value	Description
rdfs:label	String	A humanly readable description of the name.
rdf:type	<vocab:names>	The RDF type of the name.
vocab:names_name	String	A humanly readable description of the name, which is identical to the rdfs:label property of this object.
vocab:names_id	xsd:int	The identifier of the name, which is a unique number among all Name objects.
vocab:names_created_at	xsd:dateTime	The date and time of the creation of the Name object in the database.
vocab:names_updated_at	xsd:dateTime	The date and time of the last update of the Name object in the database.
vocab:names_role	String	The role that this name plays, e.g. "producer", "director", "choreographer", "composer", "author", "artist", "conductor", and so on. Not all Name objects have this property.
vocab:names_matchings	vocab:matchings	This property can occur multiple times: for each Matching object linked to this Name object.
is vocab:artistic_infos_names of	vocab:artistic_infos	This property can occur multiple times: for each Artistic info object for which this Name object is responsible.

All Name objects essentially look the same: the only fundamental difference is the value of the property vocab:names_role. Therefore, we will present one typical example.

Example: A composer

```
<rdf:RDF
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:vocab="http://rdf.arts-mobility.info/vocab/resource/"
xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#">
<rdf:Description rdf:about="http://rdf.arts-mobility.info/resource/names/samuel-
    beckett">
<rdf:type rdf:resource="http://rdf.arts-mobility.info/vocab/resource/names"/>
<rdfs:label>Samuel Beckett</rdfs:label>
<vocab:names_id rdf:datatype="http://www.w3.org/2001/XMLSchema#int">65</vocab:names_id>
<vocab:names_name>Samuel Beckett</vocab:names_name>
<vocab:names_role>composer</vocab:names_role>
<vocab:names_created_at rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2010-09-
    22T10:14:12.127</vocab:names_created_at>
<vocab:names_updated_at rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">010-09-
    22T10:14:12.134</vocab:names_updated_at>
<vocab:names_matchings rdf:resource="http://rdf.arts-mobility.info/resource/matchings/147"/>
</rdf:Description>
<rdf:Description rdf:about="http://rdf.arts-mobility.info/resource/artistic_infos/first-love-
    gare-st-lazare">
<vocab:artistic_infos_names rdf:resource="http://rdf.arts-mobility.info/resource/names/samuel-
    beckett"/>
</rdf:Description>

…

</rdf:RDF>
```

This name represents Samuel Beckett, who – according to the value of the property vocab:names_role – is a composer. This Name object is responsible for many Artistic info objects, and is linked to one Matching object.

Matching

A matching object links a name to a DBpedia resource. This makes it possible to tap the potential of Linked Data and search for more information on the artist or producer on the relevant DBpedia page.

The Matching object has the following properties:

Property	Data type or value	Description
rdfs:label	String	A description of the Matching object, for example the URI of the DBpedia resource.
rdf:type	<vocab:matchings>	The RDF type of the Matching object.
vocab:matchings_object	String	The URI of the DBpedia resource this Matching object connects to the name.
vocab:matchings_id	xsd:int	The identifier of the Matching, object, which is a unique number among all Matching objects.
vocab:matchings_names_id	xsd:int	The identifier of the name this Matching object connects to the DBpedia resource.
vocab:matchings_created_at	xsd:dateTime	The date and time of the creation of the Matching object in the database.
vocab:matchings_updated_at	xsd:dateTime	The date and time of the last update of the Matching object in the database.
vocab:matchings_created_by	String	The component that created this Matching object, e.g. "DBPediaLinker".
vocab:matchings_source	String	The source of this matching object, e.g. "DBpedia-lexical".
vocab:matchings_probability	String	The probability that this is the correct matching of the name to the DBpedia resource, represented by a floating-point number from 0 to 1.

All Matching objects essentially look the same. Below follows a typical example.

Example

```
<rdf:RDF
xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#" xmlns:vocab="http://rdf.arts-mobility.
    info/vocab/resource/">
<rdf:Description rdf:about="http://rdf.arts-mobility.info/resource/matchings/147">
<rdf:type rdf:resource="http://rdf.arts-mobility.info/vocab/resource/matchings"/>
<rdfs:label>http://dbpedia.org/resource/Samuel_Beckett</rdfs:label>
<vocab:matchings_id rdf:datatype="http://www.w3.org/2001/XMLSchema#int">147</
    vocab:matchings_id>
<vocab:matchings_names_id
rdf:datatype="http://www.w3.org/2001/XMLSchema#int">65</vocab:matchings_id>
<vocab:matchings_created_at rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2010-
    10-26T19:26:41.38</vocab:matchings_created_at>
<vocab:matchings_updated_at rdf:datatype="http://www.w3.org/2001/XMLSchema#dateTime">2010-
    10-26T19:26:41.38</vocab:matchings_updated_at>
<vocab:matchings_created_by>DBPediaLinker</vocab:matchings_created_by>
<vocab:matchings_object>http://dbpedia.org/resource/Samuel_Beckett</vocab:matc hings_object>
<vocab:matchings_probability>0.5</vocab:matchings_probability>
<vocab:matchings_source>dbpedia-lexical</vocab:matchings_source>
</rdf:Description>
</rdf:RDF>
```

This matching object represents the connection between the name of Samuel Beckett in our database and the resource *Samuel_Beckett* in the DBpedia database.

Implementation guidelines

The Travelogue prototype implements the data model that we described in this document as follows. Initially, the data may be contained in documents of any type. During the initial import phase of a document, this data is converted to a simple normalised CSV (comma-separated values) file with one line per observation, accompanied by the date stamp of the import. All CSV files are combined in a relational database. On top of this runs the D2R Server, a tool that publishes the underlying relational database on the Semantic Web, e.g. in RDF. For more information on this prototype implementation, we refer you to the *Travelogue/Space Implementation Documentation*.

To use this data model for your own data, follow these two simple guidelines. First, the flexibility of the data model with its many optional properties should not lead you to be satisfied with a coarse-grained representation of your data. You could, for example, create one Observation with multiple Artistic info objects in a time range within a country. If, however, you have more detailed information, this should be represented in a more fine-grained way. If you know the exact date, use this date instead of just a year. And if you know the exact venue, use this instead of only the country.

This principle should also be used when your own database does not match our data model completely. Some databases, for example, allow a production to be associated with multiple dates, while in our data model an observation only has one Temporal info object. Instead of creating an observation with a time range that spans these multiple dates (a coarse-grained representation), you should repeat the production for each date by creating matching pairs of observations and dates. You can then represent the fact that these are multiple performances of the same stage production by linking the Observation objects to the same Single observation object. This ensures that the information in the database is as fine-grained as possible.

The second principle lies at the heart of Linked Data: reuse existing vocabularies. That is, check whether your data can be represented using terms from well-known vocabularies, such as Friend of a Friend (FOAF), Dublin Core (DC), DBpedia, GeoNames, and so on. This has two main benefits. First, by referring to the URI, a description of the object can be retrieved from the Web, and second, since the URI is already linked to URIs from other data sources, you can browse and reuse much related data, giving you access to a large amount of additional data. An example of how this is done can be found in the Matching entity of our data model, which links a name to its corresponding DBpedia resource.

References

Linked Data: http://linkeddata.org

The four principles of Linked Data: http://www.w3.org/DesignIssues/LinkedData.html

W3C overview on RDF: http://www.w3.org/RDF/

Quick Intro to RDF: http://rdfabout.com/quickintro.xpd

What is RDF and what is it good for? http://rdfabout.com/intro/

RDF/XML Syntax Specification: http://www.w3.org/TR/REC-rdf-syntax/

D2R Server: http://www4.wiwiss.fu-berlin.de/bizer/d2r-server/

The Travelogue reference implementation: http://rdf.arts-mobility.info/

Version history

2010-10-29

Added the entities Matching and Single observation, and added a description for some properties.

2010-10-13

Explained RDF prefixes and cleaned up the document: consistent naming, better description of all the properties, better description of the examples.

2010-10-11

Expanded the examples in "Linked Data as a solution" section.
Added the entities Location and Name and updated the documentation and examples of all entities.

2010-03-08

Changed examples from tabular form to RDF/XML syntax.
Added implementation guidelines.

2010-03-04

Initial version of this document.

About SPACE

Ten national cultural institutions with an international policy and practice have created a new platform dedicated to Supporting Performing Arts Circulation in Europe: SPACE.

The members of SPACE occupy a position between politics and the artistic field in their countries, work as information centres, promote the (performing) arts at national and international level, and are experienced in supporting and running European cultural projects.

They share the belief that one of the cornerstones of European Cultural Policy is facilitating the circulation of (performing) arts across Europe, and realise there are still many imbalances in this transnational arts sphere among countries, regions, artists, disciplines and cultural operators.
The SPACE project's priorities include the mobility of arts productions and the combination of cultural mobility with cultural diversity, European citizenship, and investing in upcoming generations. Still a young initiative, SPACE intends to enlarge the network while implementing the different activities of the multi-layered project.

Members
ONDA (*Office National de Diffusion Artistique*), Paris
VTi (*Vlaams Theater Instituut*), Brussels
TIN (*Theater Instituut Nederland*), Amsterdam
NTIL (New Theatre Institute of Latvia), Riga
British Council, London
MIBAC, (*Ministero Beni e Attività Culturali*), Rome (which took over after ETI (*Ente Teatrale Italiano*) was shut down in June of 2010)
Pro Helvetia, Zürich
The Red House, Sofia
Institut um ní - Divadelní ústav (Arts and Theatre Institute), Prague
Zentrum BRD des Internationalen Theaterinstituts, Berlin

Partners
ENICPA (*European Network of Information Centres for the Performing Arts*)
IETM (*International Network for Contemporary Performing Arts*)
La Belle Ouvrage
TEAM Network

About the authors and the designer

Koen Van der Auwera gained experience as a developer at a number of large and small companies and organisations. In 2006, he co-founded 10to1, and since then has been developing customised mobile and web applications. As CTO, he is responsible for the team of developers and the project planning.

Bob Van Landuyt (10to1) finished his studies at the Hogeschool West-Vlaanderen in January 2011. He started immediately as a web developer for 10to1. He quickly earned his spurs in this area and was able to broaden his knowledge to include iOS and Android development.

Gunther Fobe studied graphic design at the Saint-Lucas Institute in Ghent. For the first ten years of his graphics career, he worked for the multilingual communication office Poplar and the Carbon 7 Records label, both based in Brussels. He is now working as an independent graphic designer in Ghent. He is currently 'in-house' designer for – amongst others – VTi, Courtisane Festival and Arthouse Cinema Sphinx.

Colophon

s p a c e
supporting performing arts circulation in europe

Education and Culture DG
Culture Programme