Travelogue

Mapping Performing Arts Mobility in Europe

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space

supporting performing arts circulation in europe

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Summary

The cultural sector as well as local, regional, national and European policymakers are required to adapt to ever-changing practices in transnational cultural exchange: export, import, various forms of cooperation, mobility of people and artworks. Up to the start of the SPACE project, a picture of the artistic mobility patterns and flows in Europe was lacking: how and to what extent are arts professionals mobile across and beyond Europe? What are the current imbalances between the different countries and regions of Europe?

Better monitoring and measuring of mobility is crucial, and reliable statistics and data collection are key to developing future cultural mobility policies, both at the level of the EU Member States and at EU level. A sustainable, long-term mapping instrument needs to be developed and implemented across the EU in order to better inform the cultural mobility debate and to highlight existing imbalances. This requires a coordinated effort by partners at different levels of government.

In the period 2009-2011 – in the context of the SPACE mobility pilot project – 'Travelogue' was set up as a research project to test various hypotheses. Can a tool be developed that makes optimal use of existing information, which is able to link very diverse national datasets on international performing arts tours? And can this tool function as a lever to raise awareness among national governments on the necessity of improving and coordinating data collections?

Building on this, the present document reports on the experience of gathering data on performing arts mobility in Europe, and exploring ways of connecting and analysing this data as a means to develop concrete steps for improving data collection on mobility.

Introduction

Context

International exchanges have changed performing arts practice in Europe substantially during the last decades. Political, technological and economic developments have helped turn Europe into a seemingly self-evident biotope for producing and presenting performing arts. Exhaustive data at European level is lacking, but partial studies indicate that international exchange has increased in recent times. Moreover, there is not only a quantitative increase, but also a qualitative metamorphosis in the international dimension of performing arts practice. International work is increasingly global, multilateral work in a network environment. International touring is less about just presenting, and more about coproducing partnerships among a growing number of international organisations. Clearly, the traditional image of 'work going from one country to another' is becoming obsolete. Networking, reciprocity and partnerships are keywords in a complex, transnational network environment.

Work going from one country to another is no longer the model. This poses challenges for cultural policies at both the national and the supranational level. In Europe, support for the arts is situated mainly at the level of the nation states, according to the principle of subsidiarity. However, the 'national' perspective is increasingly out of sync with the practice of the arts, which has become strongly international and interdependent.

So how does all of this affect the efficiency of nation states' international cultural policies? Are these policies prepared to recognise the complexity and necessity of this international dimension? There are clearly a number of imbalances (in terms of geography, career development ...) in this transnational performing arts sphere. Touring internationally seems to be more self-evident for some than for others. Questions of asymmetries and sustainability are clearly present.

In recent years, mobility has increasingly been recognised as an important topic at EU level. Since 2004, several studies and policy documents have pointed out the lack of good statistics available to underpin the development of new cultural policies on international mobility. Travelogue, the project presented in this document, is situated here. It is a research project in the context of SPACE, short for Supporting Performing Arts Circulation in Europe, which is a network linking different European organisations supporting mobility[1]. Supported by the EU as a mobility pilot project for the period 2008-2011, SPACE initiated Travelogue as an experimental research project to map the collection of data on international performing arts mobility in Europe, and to test whether current mobility mapping efforts – at national level – can be harmonised and linked in order to give us a better view of transnational mobility.

1. Ten national cultural institutions with an international policy and practice created a new platform, dedicated to Support the Performing Arts Circulation in Europe: SPACE.
   The members of SPACE occupy a position between politics and the artistic field in their own countries, work as centres of information, 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 that 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.

The idea of Travelogue was born during *Home & Away,* a conference organised in May 2008 by VTi, the institute for the performing arts in Flanders, and IETM, the international network for contemporary performing arts. Policy makers from throughout Europe gathered in Brussels to reflect on supporting future arts mobility. In preparation for this meeting, VTi and IETM gathered existing information on the international dissemination of contemporary performing arts productions: statistics on and analyses of the import and export of performances. A survey led to the identification of a striking disparity in approaches. Some correspondents replied that their countries do not map the international activities of their performing arts companies. Others submitted information that varied greatly. The architecture of the data collections was very much influenced by the institutional context in which the data was gathered. It clearly reflected political objectives at intranational or national level (e.g. monitoring audience participation, or taking into account the theatre companies' regions of origin).

In general, the survey clearly demonstrated the incomparability of different national approaches in mapping their international activities. Furthermore, institutes and governments were working in their own worlds: there were no international efforts to discuss the gathering of data in a more harmonised way.

Linked Open Data & the semantic web

New technological developments, however, offered a solution. Following an inspiring call by Sir Tim Berners-Lee at a TED conference, developments around Linked Open Data (LOD) technologies were initiated by a growing community. The idea of LOD is connected to that of the Internet as a 'semantic web', as a 'web of data' which – unlike the Internet we generally know now – not only links web pages and documents, but also links data published on the Web. Moreover, semantic web technology would allow computers and browsers to add meaning to these links, in other words to interpret the *relationships* between this data. To quote linkeddata.org, the portal site for everything concerning LOD: 'Linked Data is about using the Web to connect related data that wasn't previously linked, or using the Web to lower the barriers to linking data currently linked using other methods. More specifically, Wikipedia defines Linked Data as "a term used to describe a recommended best practice for exposing, sharing, and connecting pieces of data, information, and knowledge on the Semantic Web using URIs and RDF."'

'The current web is still a web of documents intended for human interpretation,' Bernhard Haslhofer (University of Vienna) said in his Linked Data tutorial presented at the Travelogue conference in May 2009 (Brussels), 'The data is still locked in closed silos. The Linked Data vision is to open the data silos, publish data of public interest on the Web, so that other applications can access and interpret this data using common Web technologies. And this vision is becoming reality.' Indeed, there are a growing number of remarkable applications – the BBC website for instance, or Wikipedia (and DBpedia, the database behind it), or last.fm – showing the advantages of publishing data, and not just documents, on the Web and enriching these by linking them to other data sources. The 'Linked Open Data cloud diagram', which visualises the continuously expanding web of interlinked data, can be viewed on http://linkeddata.org. It shows datasets that have been published in Linked Data format by contributors to the Linking Open Data community project and other individuals and organisations.

SPACE/Travelogue: initial aims & hypothesis

Travelogue was set up as an experimental project to test whether this emerging LOD technology could be useful in connecting existing data collections on international performing arts touring in Europe. The advantages could be numerous. Linking data is about building bridges between existing datasets, while publishing them on the Web. This would make existing datasets more useful, without needing to build a new huge database from scratch. Another advantage is the decentralised approach that is taken. As long as there are common elements making possible the links between the datasets, Linked Data tolerates great diversity among these datasets. Furthermore, publishing the data on the Web would make it more accessible, and interlinking it with other data sources offers different types of enrichment. Not only would interlinking different partial datasets on touring complete our view of international mobility, it would also be possible to enrich this information with datasets containing for instance geographic information (Yahoo Geoplanet, DBpedia) or artistic information.

To test this hypothesis, a LOD tool would have to be developed. First, we would need to adjust semantic web technology in a way that would make it suitable for dealing with specific questions concerning international touring in the performing arts. We would need to develop a data model that makes current Linked Data vocabularies more fit to describe international performing arts practice. Next, we would need to set up a Linked Open Data server and fill it with as much available data as possible. This in fact proved to be quite a challenge. Not only did we have to find as much data as possible, we also needed to find a way to detect matching information among the different datasets in order to avoid counting identical entries twice. When a Dutch company travels to France, for instance, we might find information about it in different datasets: in the one about export from the Netherlands and in the one about import in France. We might even find information in the Flemish export dataset, if the production was coproduced by a Flemish art centre or festival.

The instrument would be called the 'Travelogue prototype'. It is important to understand that this prototype is not a goal in itself; rather it is an instrument to raise awareness of and improve data collection on mobility. The challenges are not only technical, but also political. It would be important to test whether this instrument – in the framework of an EU-funded project – could act as a lever to raise awareness about the issue of data collection on mobility, and set up some very specific 'work sites' to improve data collection in Europe. The prototype would need to be the centre of a 'learning environment' on harmonising and improving data collection in Europe.

Taking up the challenge of mapping the current data-collection situation on performing arts to mobility, Travelogue decided to focus on the international touring of productions. This might sound obvious, but it should not be forgotten that there are other types of artistic mobility such as residencies, artists participating in workshops and so on. Most of the collected data on performing arts mobility, however, concerns internationally touring productions, seemingly because this data has the most direct relevance for those collecting it. Numerous valuable undertakings in gathering touring data were identified throughout Europe, initiated by diverse types of organisations. Good quality datasets on other types of mobility are rarely available. For pragmatic reasons of data comparability, the few sources that did deal with such alternative types of mobility were not taken into account in this research.

Briefly, the initial strategic aims of SPACE/Travelogue can be summarised as follows:

- → ***Map the current situation (including gaps) regarding statistics and data collection onto cultural mobility***: What is the current state of data collection on international mobility in Europe? Which data exists? Which institutions engage in this task of data collection (or would be fit to do so)? Where are the current gaps? Which parameters can account for current gaps or imbalances in data collection?

- → ***Development of an ICT tool for linking and visually presenting mobility***: Using semantic web technology, can an ICT tool be developed to link and analyse existing datasets currently being collected at the level of the Member States? What is the research potential of this existing data using such a tool?

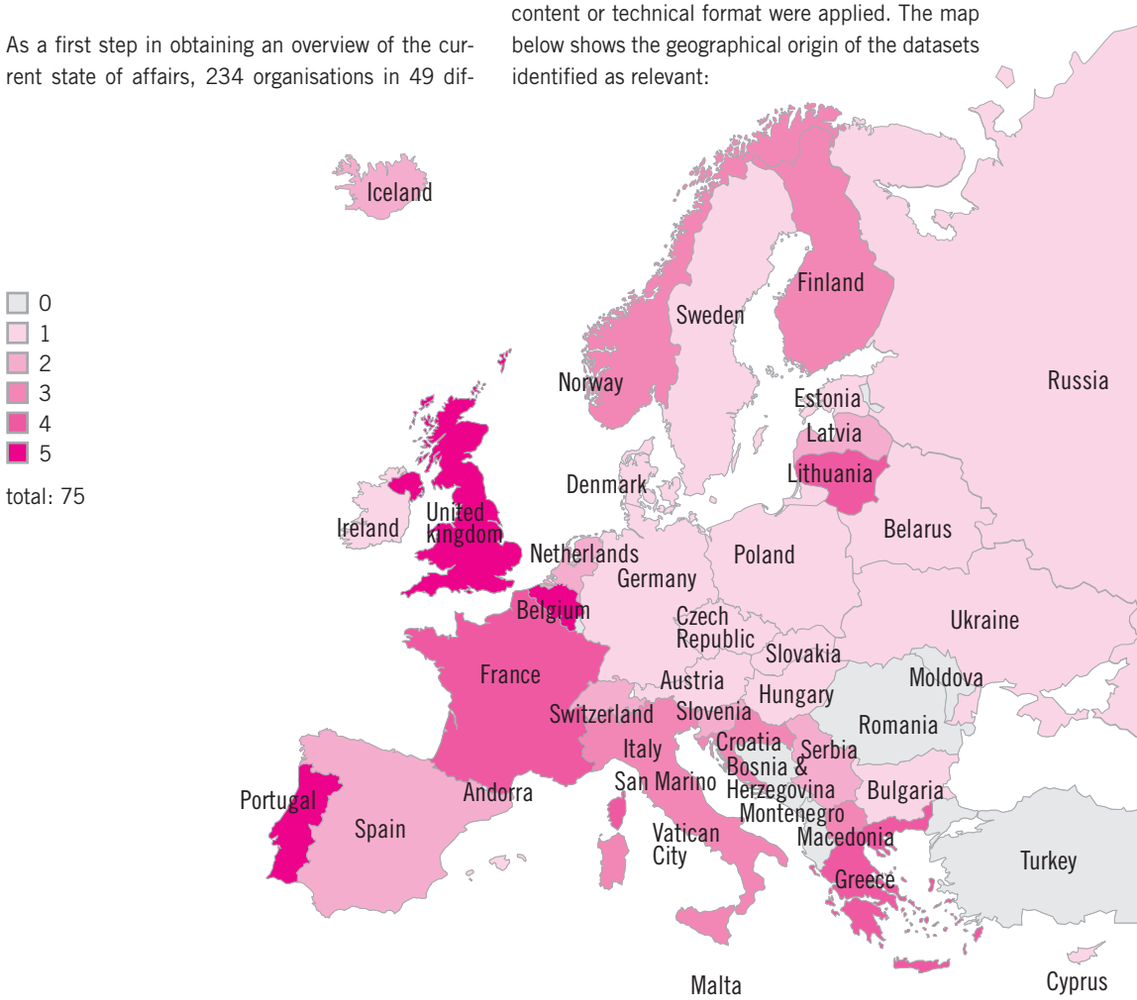
- → ***Capacity building***: help organisations and professionals harmonise and improve the standard of data collection on mobility via various actions. First, through the organisation of training sessions and a conference (May 2010, Brussels) aimed at institutional capacity building on standards and methods for linking, sharing and comparing data between countries and between sectors. Second, guidelines would be written aimed both at organisations that want to share their existing databases in Linked Open Data format, and at organisations that wish to start collecting data. This ensures that the experiences and knowledge originating from the Travelogue project can be optimally shared and used.
- → ***Formulating recommendations***: These steps will be the foundation needed to develop guidelines and recommendations required to link, share, harmonise and compare data on the international mobility of performing arts productions at a transnational level. These recommendations were included in various joint efforts of the different mobility pilot projects (SPACE, Practics, Changing rooms, e-mobility).

Data collection on mobility: current state of affairs

In a first phase of the project, we set out to map data collections on international performing arts touring. Who are the relevant partners for a project like Travelogue? What kind of data do they collect? How diverse are their collections? What points are shared in common?

Institutions collecting data

As a first step in obtaining an overview of the current state of affairs, 234 organisations in 49 different European countries were contacted between September 2009 and May 2010.[2] They were asked about the existence and availability of data on the international touring of performing arts. This survey led to the identification of 77 institutions that were collecting datasets we considered relevant to Travelogue. This meant that they contained information on international performing arts touring. At this point, no minimum requirements with respect to content or technical format were applied. The map below shows the geographical origin of the datasets identified as relevant:



2. A broad definition of Europe was adopted for this research, containing "50 internationally recognised sovereign states whose territory is located within common definitions of Europe and/or membership in international European organisations", as mentioned in Wikipedia (http://en.wikipedia.org/wiki/List_of_sovereign_states_and_dependent_territories_in_Europe#Sovereign_states).

The map suggests that the territory of Europe is well 'covered', with data collection initiatives distributed throughout almost all of Europe. The map shows a few 'blank spots' – countries where no single information centre could be identified. In most European countries, it was possible to identify at least one organisation that served as an interesting starting point for collecting information on the international touring of performing arts productions. In some countries, up to five different organisations were listed as collecting relevant information.

Before going deeper into the precise content and usability of the data gathered by these organisations, some general remarks can be made. Too few data collections in a country can be problematic. But too many possible partners can be challenging as well.

Lack of national institutions with a mandate to collect data

In some countries, no intermediary institution could be identified with a mandate to collect data on performing arts touring (e.g.: Albania, Armenia, Belarus, Liechtenstein, Romania, Turkey, Ukraine...). At best, some touring lists from individual companies or the international programming of a festival could be identified. While this information can be very helpful, the lack of official or intermediary institutions collecting and bringing together this information at the national level partially hinders the proper monitoring of international mobility. The data collected by production companies, venues or festivals tends to be mostly relevant for the organisations themselves.

Lack of coordination between different institutions with a mandate to collect data in the same country

In many countries, there are a number of different institutions collecting data from companies, venues and festivals in order to establish a macro view of international touring in the performing arts (France, UK, Belgium, Italy, the Netherlands...). This is positive, since it clearly indicates political interest in monitoring international touring activities in the performing arts. Still, very few of these institutions can be said to cover the complete picture of incoming and outgoing performances in all subdisciplines of the field. The mandate for data collection within an institution might for example be limited to a single genre (dance, opera, youth theatre...) or to a specific region.

From a national perspective, these institutions collect only partial information. The problem is that it is very difficult to compile a complete picture of international mobility from these multiple efforts. Often there is a lack of coordination.

Impact of the economic crisis / political decisions

During the Travelogue research period, the financial situation in the arts scene worsened, not only for artists but also for intermediary organisations interested in taking up a coordinating role in data collection. Different partners/institutions have been facing severe budget cuts. Institutions in Greece (Hellenic National Centre of Theatre & Dance) and Italy (*Ente Teatrale Italiano*) were unable to continue their collaboration in Travelogue as a result of their institutions being closed down by national government decisions. At present, the future of TIN, the Dutch Theatre Institute, is very much uncertain. The Dutch case makes it clear that the legitimacy of national funding for the arts is under pressure in some countries. This affects several institutional functions in the arts sector, not only production and presentation – but also support for international touring.

Diversity of data: formats, content, scope and granularity

Overall, the organisations represented on the above map proved to be quite diverse: governments, public institutions, arms length's bodies, intermediary organisations and even individual and private organisations. We contacted ministries, cultural observatories, universities, national ITI and ASSITEJ centres/offices, EU Cultural Contact Points, sectorial institutes and research centres, companies, venues, festivals, theatre museums... Adding to this diversity was the fact that even similar types of organisations in different countries can have divergent attitudes and missions when it comes to collecting touring data. While some ministries, research centres and observatories see this as belonging to their core business, others do not. Naturally, the diversity of institutional contexts we observed resulted in diverse ways of processing the data.

- → The datasets obtained were expressed in *many formats:* printed books, digital documents (word processing, PDF, XML), spreadsheets... This variation mirrors the myriad ways that performing arts touring data is gathered and processed. Most datasets received reflect whether or not the data was collected on a structural basis and for what purposes. Some datasets cover a very limited time span; others demonstrate continuity over a longer period. Some datasets originate from an existing database; some (often smaller datasets) were specially compiled for the occasion.
- → In addition to form, the *scope and content* of the datasets also varied considerably. The precise types of information in each dataset largely depended on the mission of the organisation collecting the data.
  - → The data collected reflected the organisational diversity. Unlike a cultural observatory or research centre, a government might for example only keep track of the total number of performances abroad by companies who received a travel grant from the ministry of culture. In this case, the goal is not the collection of all possible artistic information or details on the tours, but rather an economic justification of specific government expenses. Some organisations gather information on different (performing) arts disciplines, while others limit their efforts to subgenres, e.g. dance, street art, children's theatre...
  - → The type of information can differ as well. Most datasets contain information on companies performing a work in a certain place at a certain time or during a certain period. Some do not contain this level of detail and only include aggregated numbers, for example a total number of internationally touring productions per season. Additional artistic information can be found in a number of databases that specifies a genre, the name of a director/author/choreographer, coproducing organisations... A much more limited number of datasets shows audience-related information: a description of the target audience, the number of spectators (sometimes even divided into age categories)...
- → Another reality that the Travelogue prototype had to take into account in order to link and compare data from different sources is the many *different languages* in which the data is expressed. How, for example, should one deal with the names of countries and cities in multiple languages? Solutions needed to be found to make optimum use of the available data.
- → If we take a deeper look at the characteristics of the datasets, it is striking that there is *more export data* (i.e. on productions from a specific country that travel abroad) *than import data* (i.e. on foreign productions performed in a specific country). Again, this is related to the mission of the organisations collecting the data. Apparently, there is greater interest in monitoring outgoing productions than in keeping track of foreign productions. Or in economic-political terms: data on exported goods has a greater impact than data on imported goods. Directly or indirectly, this often has to do with justifying government expenses with objective data. When public money is invested, very often a return on investment in terms of economic or at least symbolic capital must be demonstrated.
- → Stage productions increasingly are international coproductions. This is important, because there are other dimensions to international collaboration than import and export: exchange and reciprocity in the framework of networks and multilateral forms of collaboration, for example. Information, however, is not always kept on pro-

ducers involved in a production other than the company staging it.

The diverging missions of the organisations collecting the data, linked to very specific national or even regional needs, result in major differences in the presence or absence and granularity of the artistic, temporal and geographic information contained in the data. It is clear that – generally speaking – a ministry, a cultural programme and a theatre institute will have different priorities concerning the collection of data on performing arts mobility. Institutional contexts and issues related to national cultural policies have an important impact on the 'biotope' of data collecting initiatives.

Main challenges for the prototype

This mapping of data collection in Europe reveals two main challenges that an instrument to monitor mobility must deal with: one technical, the other institutional.

- → The technical development of an ICT tool and data model able to interlink this very diverse data.
- → The mapping of data collection on mobility in Europe reveals that improving data collection at the national level – and harmonising current approaches – will remain the most important challenge. In order to nourish future initiatives, Travelogue tested different strategies to stimulate improvements in data collection at the national level: raising awareness, developing networks, providing technical documentation and one-on-one support.

Development of the prototype

A flexible data model

Since the datasets we collected were so diverse, the Travelogue prototype required the development of *a flexible data model* onto which to map all these differently stored datasets. The first choice to be made concerned a lowest common denominator: *what is the minimum information required to integrate a dataset into the system?* A balance had to be found. On the one hand, we wanted to be able to integrate as many datasets as possible. On the other hand, we needed to ensure a certain level of quality in comparing and linking the data.

For reasons of data comparability, the Travelogue data model is built on the concept of *'observations' of events containing at least three core elements*:

- → Artistic information
- → Temporal information
- → Geographic information

Which artist, company or performance was being staged? When did this happen? And where: at which venue, city or country? These three elements were put forward as the minimum information needed in datasets in order to fit into the Travelogue data model. These building blocks were initially kept very vague. Within the Travelogue framework, we needed to find solutions to handle very diverse datasets, so this vagueness was an asset needed to ensure maximum flexibility. Seen from this perspective, the concept of 'observations' is a fruitful one. It can be compared to reported UFO sightings. The level of detail in the descriptions of UFO sightings can also vary enormously, but three core elements are usually present: a description of *what* was spotted, *where* it was spotted and *when* it was spotted.

As is the case with UFO sightings, our 'observations' are not 100% objective descriptions of a given reality. They are discursive – even performative – acts: someone is stating that a certain event happened at a certain time and place. In so doing, different instances describing the same event can provide different and complimentary details. In the case of UFO sightings, this could be the number or colour of flashing lights, the duration of the observation... We needed a system flexible enough to recognise all of these diverse details observed by different people as complementary elements of the same event.

The same goes for our performing arts observations in the data model we developed. The precise content of the artistic, temporal or geographic info can vary greatly:

- → The *artistic information* always contains at least some elements concerning what was performed and who was involved. This may be the title of the performance and/or the company, the name of a director or choreographer, sometimes the author of a play, the genre...
- → The *temporal information* should at least provide some information on the time of performance. Some datasets mention a precise date and even a starting hour, others mention an opening and closing date. Still others contain the month and the year but not the day. Some only mention seasons or calendar years. The Travelogue data model makes it possible to link and compare datasets employing all of these varying approaches.
- → The *geographic information* tells more about both the geographic origin of a production and the area where the performance took place. Again, the level of detail with which geographic information is expressed throughout the datasets varies greatly: sometimes the exact address of a venue is mentioned, other times only the name of a city or a country.

Although at least some artistic, temporal and geographic information is required, none of the specific elements mentioned above are needed for the integration of a single dataset.

Setting up the prototype

After developing a data model, a Linked Open Data server was set up to contain the data from the different datasets. Eventually, of the 77 datasets we identified above as being relevant, 30 were integrated in the Travelogue prototype presented at Krakow in October 2011. The other 'relevant' datasets can be divided into 5 categories:

- → 5 datasets met our minimal requirements but were not integrated for pragmatic reasons (time and budget constraints). They reached us too late for the deadline but might still be added later.
- → 8 datasets did not contain the minimally required artistic, geographical or temporal information to fit in the Travelogue data model. Due to our efforts, some of these databases have been adapted since the first research phase in 2009-2010, so that they now could also be integrated in the prototype.
- → 9 datasets could not be delivered in a structured format useable with the Travelogue data model, but rather for example only as a .doc or PDF file.
- → 6 organisations potentially collect interesting information, but did not respond to our further questions to identify the exact scope, content and format of the collected data, or they simply did not send the data.
- → 20 datasets were identified as (possibly) containing relevant information, but the data model and possibilities for exportation of the data were not communicated in a detailed enough way.

The 30 datasets that were integrated into the prototype were mapped to the Travelogue data model. This resulted in each data field in each dataset being matched to the Travelogue vocabulary needed for a flexible description of touring productions. This made it possible to link the different datasets and access them from one central point.[3]

In a first phase, Excel exports of the datasets were used to bring the data together in the Travelogue prototype. A second step involved setting up live, Linked Open Data connections between different datasets. Instead of working with static versions of data and combining these, organisations were encouraged to make their data accessible on the Web in a way that could be queried and reused by others. This made the data living, dynamic, interlinked and open to access for all. Concrete steps were taken at different levels to support organisations who wished to open up their data in the Linked Open Data format. More details on this can be found in the chapter 'Case studies'.

Tackling some of Travelogue's issues

Having grouped the available data that was able to be mapped to the flexible Travelogue data model, we could start thinking of solutions to some of the problems mentioned above.

Matching geographic information in different languages

One of the problems was the different ways and languages in which geographic locations are expressed throughout the different datasets. To tackle this problem, the data was linked to Yahoo's GeoPlanet database, which is published as Linked Open Data under a Creative Commons licence, which makes it freely available to all who want to reuse the information. The GeoPlanet database has several advantages for Travelogue. First, it contains the names of countries and cities in different languages. Via the GeoPlanet database, Travelogue can link databases with geographic information in different languages. For example, 'Brüsszel', the Hungarian name for Brussels, will automatically be matched to the Dutch term 'Brussel' or the French 'Bruxelles'. Historical country or city names (USSR, Leningrad, Leopoldstad...) are also included in the database. A second great advantage of the GeoPlanet database is its hierarchic structure: all locations in the GeoPlanet database have relationships with other locations. For example, a city is always located in a country, which is located on a continent. Hence, Travelogue is able to use datasets that contain only one of these elements. More details on this can be found in the Yahoo! GeoPlanet Guide.

Detecting duplicates in different datasets

For Travelogue, we use datasets on export (information on performances from a specific country that tour abroad) as well as import (the other way around). This means that Travelogue could contain duplicate observations: a Belarusian performance in Finland, for example, might be described in both a Belarusian export dataset and in a Finnish import dataset. The Travelogue prototype turned this challenge into an advantage: an algorithm to detect duplicates was developed, and when duplicates are detected, the two datasets are able to enrich one another.

In this case, the temporal, geographic and title information of both observations are compared, matched and labelled with a matching score ranging from 0 to 1 that indicates the likelihood that both observations relate to the same event. The matching score is an automated indicator of the certainty that two observations concern the same performance. The score depends on the level of overlap and non-conflicting information in the two observations.

These excerpts from a matching log file indicate on which basis two observations obtain a certain matching score:

```
### 1: title: Being Harold Pinter
       host:Suomi, (Joensuun Kaupunginteatteri, )
       origin:Belarus, ()
       dataset: Finland_TheatreImport_all
       certainty: 0.65
       date: //2007 at ''
### 2: title: Being Harold Pinter
       host:Suomi, Helsinki, (, Festival Baltic
         Circle)
       origin:Belarus, ()
       dataset:Belarus_BelarusFreeTheatre_Ex
         port 20052009
       certainty: 0.65
       date: /11/2007 at ''
```

The matching log identifies information in two datasets – Belarusian export and Finnish import – as being very similar. The corresponding information in both observations is the title, host country, country of origin and year. Thus, the information contained in Travelogue is richer than that in either of the original datasets. The Finnish dataset has additional information on the venue, whereas the Belarusian dataset mentions more details about the city, the festival and the month. Since this information is not conflicting but complementary, a matching based on the overlapping information is possible. In this case, a certainty score of 0.65 was obtained.

```
### 1: title: Bolero variations
       host:France, Armentières, (, )
       origin:Deutschland, ()
       dataset: Germany_DanceExport2009
       certainty: 0.7876336898395722
       date: 10/1/2009 at ''
### 2: title: BOLÉRO VARIATIONS
       host:France, ARMENTIÈRES, (, )
       origin:Allemagne, ()
       dataset: France_Import20002009
       certainty: 0.7876336898395722
       date: 10/1/2009 at ''
```

3. We used a D2R Server to publish our underlying relational database on the Semantic Web: the application uses a customisable D2RQ mapping file to map the database content into RDF. D2RQ is a declarative language used to describe mappings between the schemata of the relational database and the target RDF terms. More info can be found in the technical documentation and guidelines on www.arts-mobility.info.

The second example shows a higher certainty score than the first, mainly due to an exact match for the host country and city, and an exact match for the date, down to a specific day. Note that some variation is tolerated when matching two observations. For example, differences in accents or capital letters are ignored. This example also demonstrates one of the benefits of working via GeoPlanet: the country of origin "Deutschland" is recognised as being identical to "Allemagne".

Enriching artistic information

The linking of different datasets in Travelogue mutually enriches the information. The link with GeoPlanet demonstrates the possibility for enriching and contextualising the information available in the datasets with data available elsewhere on the Web. To enrich the *artistic* information in Travelogue, a link with the DBPedia database was established.

DBPedia is a LOD database containing data from Wikipedia, published on the Web and stored as RDF. Similar to the matches between different Travelogue datasets, artistic info is automatically matched to the DBPedia data, accompanied by a matching score. Because the results of the automatic linking are not optimal, manual disambiguation will be needed in the future to optimise the results. This could be achieved by manually approving or disapproving matches falling within a certain range of scores.

Interim conclusions

The experiments in Travelogue revealed that working with Linked Open Data offers possibilities for using existing information to begin establishing an overall view on performing arts mobility in Europe. First, a data model was developed that allowed links to be made between very diverse datasets. Second, this diversity becomes a benefit: not only when different Travelogue datasets are interlinked, but also when the information in Travelogue is connected to information kept elsewhere on the Web. GeoPlanet and DBPedia are only two of the databases in the continuously growing 'Linked Open Data cloud': databases that have been published on the Web as Linked Open Data.[4]

Although the achievements made with this first prototype provide hope for the future, and the first technical results were satisfactory, experiments with the prototype also revealed a number of limitations.

→ Automatic matching is possible, but manual interventions are still needed to clean up the data and make it comparable. In the future, this might be left to a community of users.

→ The prototype should be seen as a proof of concept rather than as a sustainable instrument. It was built to test technical hypotheses and will need future developments to make it more sustainable and user-friendly.

→ The greatest limitation remains the availability of good data. Despite the existence of many valuable initiatives, bringing together this data leaves us with only a partial view on the mobility of performing arts productions throughout Europe. Therefore, the importance of well-coordinated, high quality data collection in every Member State cannot be stressed enough.

4. Cf. http://richard.cyganiak.de/2007/10/lod/

The atlas: exploring analytical possibilities

The concrete result of this work is a website – www.arts-mobility.info – that combines, makes available and visually presents the information from the various data sources. There is a visual presentation of the data on an interactive map, and a summary of the data via country profiles.

The data is also used by the Speculoos graphics agency for developing the Travelogue atlas: a series of maps that examines the international distribution system for performing arts presentations in Europe from various perspectives, subject to the availability of sufficient data. There are three types of visual presentation: a first starts from the perspective of export, a second from import and a third depicts production tours from a specific country.

The website and atlas have a double goal: on the one hand, to make the collected data available via Travelogue in various ways. The maps not only make the data readable to individuals; as 'Linked Open Data'. Technically, it would also possible in principle for computer systems to query and reuse the data. On the other hand, bundling the data also makes it possible to get a feel for what is possible with respect to analysing the data (in the light of the limitations we encountered related to data collection).

Description of the data in the prototype

It was explained above that ultimately 30 different datasets were made available via the prototype (see annex). In total, Travelogue – after taking into account the duplication of the data in the original data sources as explained above – bundles 20,707 different 'observations' related to international performing arts presentatios.[5] What then is the potential for analysing this data collection, today and in the longer term? How does the instrument already provide an answer to the above made observations today?

A number of possibilities and limitations emerged above, related to data collection on mobility in various European countries and regions, that Travelogue had to come to terms with. We briefly mention that in several countries and regions, extensive data collections were sometimes already available, and we were able to use much of this data for the system. We already noted above imbalances in the way in which data is collected.

Apart from these geographical inequalities, there are also huge differences in the size of the datasets that serve as basis for the data collection: some contain only thirty observations. The largest data collection (VTi in the Dutch speaking part of Belgium) contains more than ten thousand observations; the smallest only three. Here again there is an imbalance. Various factors come into play here. Reality certainly plays a role, but the way in which data is collected is also significant. Flemish companies are very active and well-known internationally, but of course the way in which VTi collects the data also probably plays a major role: not only the diligence with which the staff collects this data on a daily basis, but also the fact that not only productions of Flemish companies are included, but also data on productions of non-Flemish companies for which Flemish festivals or performing arts centres are indicated only as coproducer or other type of partner[6]. This relativises the dominance of the Flemish data within the totality.

5. Situation on 18/06/2011. Due to live LOD connections , the number of observations has been growing since.
6. The VTi data is available on the Web at http://data.vti.be. For more information on the VTi data collection, and a study on international tours and coproductions based on this data, see Joris Janssens (ed.), Ins & outs: A field analysis of the performing arts in Flanders. Brussels, VTi, 2011.

These imbalances require the data to be read properly. There are a number of limitations in this regard, but at the same time also a number of opportunities that the visual presentations on the poster attached to this publication take advantage of.

‘Stars’: export from a number of countries

A first series of visual presentations – on the front side of the poster – bundles ‘export’ data per country. How many ‘observations’ does the Travelogue data contain of productions with a producer from that specific country? How many productions ‘depart’ from a specific country, and in what cities are they performed?

The diagrams all depict an area whose contours – or the external border if you will – are determined by all the cities where work from a specific country is performed. The cities are given a place on the graph in function of their distance to and their angle in relation to the centre of the country of origin. In this way, each map visually represents the relationship of a country to cities in other countries. The red colour adds extra information, this time based on the relationship between two countries: the volume of exchange between two countries is expressed by the thickness of the red line.

A good example is the Belgium export map. We after all have quite good data on productions, principally based on the data gathered by VTi for the Dutch-speaking region. All things considered, the ‘area’ covered by Flemish productions is reasonably extensive. The graph is ‘spiky’, which means that productions from Flanders are performed in many different cities. At the same time, the red areas – that indicate the volume of the exchange between countries – show that the accent nevertheless remains strongly on the countries neighbouring Belgium. The red lines to in the first place France, second the Netherlands and a certain distance behind, Germany, are very thick compared to export to other countries. The red lines to other countries are less prominent. The picture of export from the Netherlands is similar: striking is a strong orientation toward neighbouring countries Belgium and Germany. Of course, the location of the Netherlands makes it less north-west oriented.

A completely different picture is obtained when we examine the export map of Latvia. This map has a very different orientation than the Belgian one. The image of Belgium is a star whose points emanate evenly on all sides, which shows that Belgium occupies a central position with respect to its market. Latvia on the other hand occupies a peripheral position: not so much concerning the volume of the export, but rather its orientation. The points of the star are not evenly distributed, but rather have a strong orientation toward the west, i.e. to Europe. Unlike Belgium, the export explicitly targets neighbouring countries much less. Again Germany and France also appear to be important. The dominance of these countries is less prominent.

It is also interesting to compare the graphs for Italy and Spain. Again, we see areas that give us a picture of the export from these countries to cities in other countries. Striking is the fact that the maps for these Southern European countries have a specific orientation. This is north for both countries, but north-east for Spain and north-west for Italy. The difference – again – has to do with a strong orientation toward France, which is a major market for productions from these countries. Both maps also show that many different cities in France are affected.

Those with a bit of knowledge on the distribution of the performing arts in Europe will not be surprised by the central position occupied by France with respect to countries such as Belgium, Spain or Italy. At the same time, the most recent examples also appear to show that limitations to data collection play a decisive role. The Travelogue prototype contains no datasets with export data from Italy or Spain; hence, these maps were created based on other countries’ import datasets. The extensive ONDA dataset containing data on import into France played a significant role here.

In a nutshell: the star graphs show that a certain degree of comparison is possible with respect to the export patterns of different countries. Various pictures of Europe emerge that shed light on the fact that different countries have very diverse perspectives on Europe. We have good data for some countries, so that a realistic picture is portrayed. For other countries, Travelogue compiled data from diverse datasets, resulting in a *fuzzy* picture: incomplete to be sure, but with sometimes realistic contours.

Tours

A second series of visualisations – on the backside of the attached poster – presents a lively picture of tours of performing arts productions. Like the star maps, these visualisations concern export: they link data on countries of origin to the cities where productions from this country were presented. New this time is that information on the timing of performances was also used. The lines represent connections between successive performances of the same production. Thus, productions are ‘followed’ when they go on tour. It is again the case that a readable pattern emerges for some countries because good data is available. For other countries, this data is missing (for the moment), leading to patterns that appear nonsensical. Seen globally, however, important observations can be made.

Unlike the star maps, these maps provide a picture of the intensity of the traffic between countries and cities. The picture provided of the Netherlands is again a striking example. There is much data available, resulting in a very dense and seemingly opaque pattern of lines that at the same time constitutes a well-defined image of the export pattern of Dutch productions. Again primarily the exchange with neighbouring countries appears to be very intense. Especially Flanders is a priority travel destination for the Dutch productions over which Travelogue collected data. The map is almost completely black. German cities are also frequent destinations. To the extent that the distance to the Netherlands increases, however, more white appears on the map and patterns emerge: there are cities that are visited only occasionally, while others are visited regularly. When more lines converge in a given city, this indicates the importance of this city for productions from a specific country. The importance of Paris as a hub for Dutch productions is clear.

Comparing the different mini-maps to each other, in very many cases there appears to be a clear centre and a less frequently visited periphery. This also applies to Slovenia, Switzerland and Hungary. Many cities in Slovakia and Croatia are visited by Hungarian productions. At the same time, Hungarian productions appear to be very well distributed throughout Europe, and there are a number of more distant cities (such as Mons, Brussels and again Paris) that are visited frequently.

Finally, while very often a centre and periphery can be discerned, the relationship between ‘centre’ and periphery varies significantly according to national perspective. Each of the different maps, in its own way, provides a picture of Europe. All things considered, these images differ strongly according to perspective. Together they shed light on the very diverse images and visions that exist at different places in Europe.

‘Lines’: import in a number of countries

The line graphs again reveal a very different perspective on the distribution of performing arts presentations in Europe: that of import. We again see an entire series of maps with information on productions *in* different countries. In each case, the lines connect all the cities in that country where international work was presented with the foreign countries where the work originated.

An example is the map of France. This indicates where the work originated for all French cities where international work was presented. (The data is largely based on the list of projects that were supported by ONDA during the period 2000-2009, supplemented with data from the export databases of various countries). The map visualises the distribution system in France, and at the same time provides a picture of the diversity of the production offerings. The map shows the contours of the French hexagon, within which the position of Paris is clearly dominant. We note that the lines on the graph do not indicate the intensity of the traffic. When more lines converge around Paris than in Brittany or Strasbourg, this indicates the diversity of the production offerings – or at least the *origin* of these offerings.

We note that the capital Paris occupies a central position concerning the international distribution of international productions in France. Here, work from many different countries can be seen. Diverse maps demonstrate the central position of capital cities within a national context. The central position of Paris applies not only to France but also to Europe. None of the other maps shows cities where so many different lines converge.

This visual representation technique also reveals the potential for analysis and the limitations of data collection. The line atlas again makes it possible to compare different import patterns, but again shows an incomplete picture for many countries, with it not always being clear whether the low diversity mirrors reality or rather results from data collection limitations. We noted above that export data often is more available than import data. The maps show, however, that Travelogue has the potential to fill in the gaps. Take the example of Germany. Unlike France, we have no dataset with systematically collected data on international productions in Germany. Nevertheless, we see that an image gradually appears of the distribution of international productions in Germany, based on the various sources that inject data into Travelogue. Of 10 countries of origin that appear on the German map, we have data referring to a total 15 cities in Germany.

'Hotspots': online visualizations of the Travelogue data

The greater European map at www.arts-mobility.info also shows that – despite the lack of good data on import – a new picture is gradually emerging from the collected Travelogue data of the distribution of productions in Europe. On the website, Google Maps technology is used to bundle the Travelogue data according to the cities where the productions took place. Observations can no longer be reduced to 'import' or 'export'.

The www.arts-mobility.info website shows clearly that there are different distribution systems at different locations in Europe. Zooming in on large cities such as Paris or London confirms the image sketched above. They are 'metropolises' whose international production offerings enjoy an excellent reputation and that must serve a large hinterland. Capital cities also play a major role in other countries such as the Czech Republic and Hungary. However, distinctly different distribution patterns also appear on the European map, for example in the Low Countries. Flanders and the Netherlands have no such central venues, but there is a strongly distributed network of theatres and cultural centres where the international productions take place. There is no metropolitan cluster, but rather a sort of "light mist" of venues. It is also remarkable that this mist transcends the borders. Unlike the case of the line maps, www.arts-mobility.info depicts a global map of Europe. This shows clearly that the lowland mist is not limited to Flanders and the Netherlands, but extends to the west of Germany and the north of France.

This phenomenon – known as urban (or suburban) sprawl – of course is not unknown in debates on town and country planning. This concept refers to places where specific urban functions, such as housing or the possibility to shop or relax, are decreasingly limited to city centres, but rather tend to extend across ever-greater areas. These have a lower intensity but cover a greater area. Only one of the associated consequences is the increasing importance of the road network to the detriment of public transport. The picture presented at www.arts-mobility.info shows major similarities with the picture that surfaces in studies on (sub)urbanisation, such as the publications of Rem Koolhaas, which view the phenomenon of urban sprawl as a typical symptom of the 'generic city' of the future.

International production offerings are perhaps one of the indicators to visualise of the extent of urban sprawl in Europe. Whatever the case may be, allowing these to be seen in parallel shows us that the Travelogue data indeed points to the impulse toward a unique view of the distribution system for productions in Europe, but at the same time that there is still much structural work to be done to improve data collection. This is an important focal point for projects that follow up on Travelogue.

Case studies: the Travelogue prototype as leverage

In order to obtain a better view of mobility in the realm of European performing arts, Travelogue has taken a number of technical and analytical steps. An instrument was developed that has the potential to bring together very diverse sources of data into a single central point, in a way that makes it possible to formulate and answer research questions. This provided the above-mentioned impulse to characterise export and import patterns or international tours. This impetus for analysis demonstrates Travelogue's potential as instrument; at the same time it also became immediately clear that our picture of artistic mobility in Europe today can only be partial, because much basic data is still absent simply because no one has collected it. Consequently, one of the most important conclusions of the project is that *the* challenge of the future is improving data collection.

How can the collection of data on international performing arts mobility be improved? The pilot project Travelogue has already dealt with this in a number of ways.

Technical documentation and support

To begin with, it was important to develop not only technical standards, but also to actively promote these standards and to support a number of intermediary organisations in a process in which they endeavoured to publish their data online in a way that makes it possible for this data to be queried from Travelogue. For this, not only were a series of documents developed with the intent to help organisations themselves take the steps needed to adapt their databases to the newly developed international standard. In most cases, it appeared that guidance was desirable. Travelogue tailored this guidance to a number of organisations with different needs. In practice, after all, organisations differ in the distance needed to travel to meet the ideal of a Linked Open Data connection making possible the gathering of data 'live' on the Travelogue server or other systems, and reusing it in new contexts. Some organisations were already close to this ideal at the moment we spoke to them. On the other hand, others were concerned with setting up a data collection system, which entailed different needs and issues. In order to deal with this, Travelogue selected a number of 'cases' to serve as a basis for developing technical guidelines and documentation, and for refining the prototype.

Developing and promoting technical guidelines

10to1, the developers behind the Travelogue prototype, wrote two documents: an extensive description of the data model and guidelines for its implementation. (Both documents can be downloaded from www.arts-mobility.info, the Travelogue website). The goal of this technical documentation is to allow organisations to publish their data on the Web as Linked Open Data, so that it can be queried via Travelogue. This documentation indeed enabled a number of organisations to do so.

In the four cases described below, one-on-one support was offered to help organisations open up their data in LOD format. After the final version of the documentation on the data model and implementation guidelines, two organisations (Dance Information Norway and Dance Info Finland, both members of the ENICPA[7] network) were asked to link their databases to Travelogue on the basis of the technical documentation, without extensive technical assistance. Dance Info Finland had recently published their database in LOD format. The challenge thus lied in providing a mapping to the Travelogue data model in order to link their database to Travelogue. Dance Information Norway had no LOD database yet, but was very much interested in working with the technology. When this report

7. European Network of Information Centres for the Performing Arts (www.enicpa.net)

was being written, it was still unclear how far these organisations could go without further technical assistance. Their feedback will be used to update the technical documentation where necessary.

Providing one-on-one support

One-on-one support was developed for organisations at various levels of advancement in data collection. This gave us an idea of the needs of the broad spectrum of organisations currently interested in data collection and Linked Open Data.

→ The first LOD connection was realised using the VTi (Flemish Institute for the Performing Arts) database. This was the easiest step to take, since the VTi database was already published in LOD format (http://data.vti.be). Mapping was developed to allow the VTi data to 'talk' directly to the Travelogue prototype.

→ A second case study was the publication of the data collected by AML, another Belgian organisation – this time from the French speaking community – with a performing arts database. A draft version of the technical guidelines combined with technical assistance resulted in a second 'live' LOD connection.

→ As a third example, the Czech Arts and Theatre Institute (also a member of ENICPA) was chosen. This organisation had already been working on collecting data on international performing arts touring. The fact that they already had a database system in use, together with their interest in making data visible on a European scale, made this organisation an interesting case. Since Travelogue's aim is not to build one large European database or to make every organisation use the same software, the Czech case was a major challenge for our project. One-on-one support was needed to make collaboration with Travelogue possible. Some preparatory work, such as getting to know the data model, was done in advance and from a distance. In a second phase, the detailed mapping to the Travelogue data model and the online publishing of the data was done on site. As a result of this support, the data from the Czech Theatre & Arts Institute is ready to be published online and shared with (among others) the Travelogue prototype.

→ As a final case, we sought a country without intermediary institution dealing with data collection on internationally touring performing arts productions. Initially, the Hellenic National Centre of Theatre and Dance (HNCTD) wished to collaborate and start collecting data with the help of SPACE. The economic crisis, however, forced the Greek government to stop funding for this organisation, which resulted in their closure. After the exit of the HNCTD, the Portuguese cultural observatory OAC (*Observatório das Actividades Culturais*) was contacted since it had shown special interest in the project during the first research phase. The starting position in Portugal was quite different from the situation in the Czech Republic. No data collection of any kind had been done and it was not clear which intermediary organisation could obtain a political mandate from the national government. Before the concrete one-on-one support could be started, OAC needed to obtain this mandate from the local authorities. Since there was no database to start from, technical support was somewhat lighter than it was in the case of the Czech Republic. Because the VTi database was developed in LOD format and offered under an open source license, it was possible to deliver a database tool that is now being used by OAC to collect and share data.

Working with these organisations was of mutual benefit. In addition to the direct impact on data collection and sharing in the Czech Republic and Portugal, these case studies were crucial to obtaining feedback on earlier versions of the technical documentation and learning more about how to organise future one-on-one support for other organisations. The above-mentioned cases also confirm the importance of flexible one-on-one support that meets the specific needs of each organisation.

Networking and raising awareness

Capacity building with respect to documentation or knowledge centres is thus one strategy that can be followed. It is clear, however, that this is not the only possible strategy. We also note in particular that in many countries either a good contact point was lacking, or that there were several contact points without good coordination between them. This observation makes the deployment of Travelogue not only technical or analytic, but especially also *political*. After all, there was not an unambiguous mandate in all countries concerning who should record which data, and how this should be done. Hence, it is important to be able to convince the right government agencies of the need for good data sources as a foundation for future arts policy. At the same time, it is also necessary to bring the right partners together at national level, in order to make possible better harmonisation in the future.

International coordination

One of the Travelogue goals was to improve the international harmonisation of data collection. Diverse actions contributed to this.

→ The work by Travelogue was given momentum in a two-day conference held at Brussels in March 2009, in which representatives of 45 organisations exchanged information on their way of working. Here the foundation was laid for developing the Travelogue data model.

→ Work on Travelogue became a hub for meetings of ENICPA, the European Network of Information Centres for the Performing Arts. The good contacts between the members of this network facilitated communication around Travelogue in a number of cases (see 'one-on-one support').

→ In collaboration with other pilot projects on mobility – Practics, Changing Room, e-mobility – SPACE worked on a series of recommendations and policy proposals around the future support for mobility at the level of the EU and its Member States. Recommendations for improved data collection were a part of these. In the framework of the so-called 'Open Method of Coordination' – the procedure with which the EU wishes to adapt its cultural policy to that of the Member States – Travelogue was proposed to the working group on mobility policy.

Intranational coordination

There is a need for concerted action not only at international level, but also *within* countries, since a number of institutions are active in the field of mobility mapping. At the initiative of the SPACE members, ONDA, the British Council and ETI – the relevant organisations in France, the UK and Italy – were brought together for national information and working sessions on international performing arts touring data.

→ France: The working session with ONDA, Arcadi, CNT, CND, *Cultures France* and *ores les Murs* was a first opportunity to exchange knowledge on existing data collection practices. (After this meeting, ONDA was commissioned to make a study on the performing arts exchanges between France and the rest of Europe[8].)

→ Italy: Shortly after a very fruitful working session in Rome, the announced closing of ETI hindered future actions. The working session in Rome was attended by some 35 representatives of regional cultural monitoring organisations, theatres and companies. The fact that many from the regional monitoring organisations had barely met before is indicative of the lack of intranational coordination between these data collection initiatives.

→ UK: In a small-scale working session with representatives from the Arts Council England, the Scottish Arts Council, the British Council and the Welsh Arts Council, the data collection methods used within the various organisations were explained.

8. Marie Deniau, Les échanges entre la France et l'Europe. Paris: ONDA, 2011. http://www.onda.fr/en/documents.php?doc=42.

This was a first step in finding ways to help organisations work together on data collection. Follow-up, however, will be necessary in order to maintain momentum. While of course, the promotion of concerted action at the national level is the responsibility of Member States, the experiences with Travelogue clearly indicate that the existence of a supranational initiative functions as a stimulus for Member States to take such joint action.

Travelogue as stimulus

Over a period of three years, Travelogue took a number of actions to test very diverse strategies for collecting data on improving performing arts mobility:

- → The development of networks,
- → Raising the awareness of political bodies, concerning the importance of such data,
- → Developing the right competencies within organisations,
- → Providing the required documentation as a Linked Open Data 'toolkit' that allows information managers at organisations to go to work,
- → Technical support tailored to the individual needs of organisations.

Improving data collection will remain a priority in the future. Since a basic technical infrastructure was set up and generic documentation published in the framework of Travelogue as pilot project, the accent must shift to support tailored to individual needs and raising political awareness at a national level. After all, until now we have assumed that primary responsibility lies at national level. At the same time, experience with Travelogue shows that an EU initiative contributes favourably to this: concerning the development and implementation of technical standards, as well as with a view toward political harmonisation and raising awareness of the need for such data.

Conclusions and recommendations

The cultural sector as well as local, regional, national and European policy makers are required to adapt to ever-changing practices in transnational cultural exchanges: export, import, various forms of cooperation, mobility of people and artworks. Several studies and policy letters indicate that better monitoring and measuring of mobility is crucial, and reliable statistics and data collection are key to developing future culture mobility policies. Travelogue is a first step towards completing our picture of artistic mobility patterns and flows in Europe: to what extent and how are arts professionals mobile across and beyond Europe? What are the current imbalances between different regions in Europe? A prototype that links existing data is now operational and the current state of affairs concerning data collection has been mapped. Still, a sustainable, long-term mapping instrument needs to be further developed and implemented across the EU in order to better inform the cultural mobility debate and highlight existing imbalances. The lessons learnt working on the Travelogue prototype are useful in this endeavour. They demonstrate the technical feasibility of a Linked Data project around (performing) arts mobility. Nevertheless, the current gaps in data collection are evident. Hence, improving existing data collections on performing arts mobility will be essential to the development of a sustainable future instrument. This will require a coordinated effort by partners at different government levels. How can this be achieved? Based on the research done by the Travelogue project, SPACE make the following recommendations:

EU Member States must increase and improve data collection at national level

The current gaps in data collection hinder our view on international culture mobility. Today, not every EU Member State collects data on culture mobility. National governments need to organise systematic data collections on culture mobility at national level, and support local, regional and national professional organisations in working with partner organisations in their own country and in other countries to achieve more coherence in data collection.

EU support is needed for data collection and analysis on cultural cross-border mobility

To accurately monitor mobility, current gaps and imbalances – as well as the lack of coordination in data collection – also need to be addressed via a supranational initiative. Travelogue shows the need for coordination and network development to connect key players and increase the value of the disparate efforts at national level. To continue developing a coherent view on mobility flows, the EU needs to develop and support a series of incentives and coordinating actions:

- → Map the current situation (including gaps) as regards statistics and data collection on cultural mobility
- → Identify relevant institutions at national level and provide a detailed description of available data sources in different European countries (and at supranational level)
- → Connect relevant institutions and key players engaged in data collection on culture mobility in different countries with the aim of setting up a sustainable network
- → Promote a harmonised approach to data collection at national level in order to achieve a common and comparable level of data collection
- → Continue the development of an ICT tool to connect and enrich existing data. Linked Data technology provides an excellent opportunity and an open framework to interconnect mobility data and enrich this with a wide array of other data sources
- → Encourage and mobilise new partners to start new data collections, by proactively convincing

new partners to join the network. An important aspect is providing technical support (via technical guidelines, a helpdesk, workshops on best practices in local data collection, etc.)

→ Support capacity building for national institutions collecting data

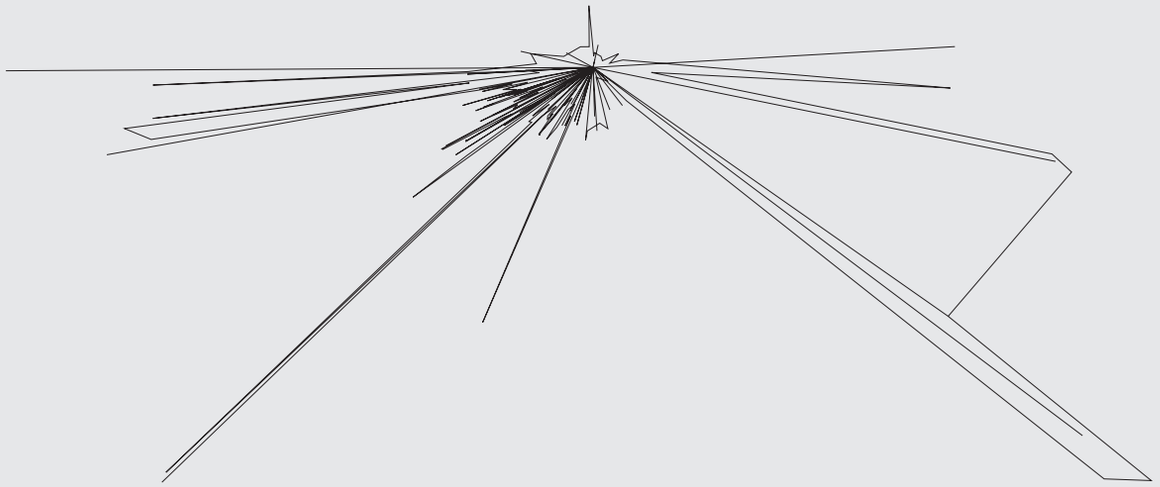
→ Support the development of tools similar to Travelogue for other art disciplines

Belgium

Stars: productions touring to foreign cities

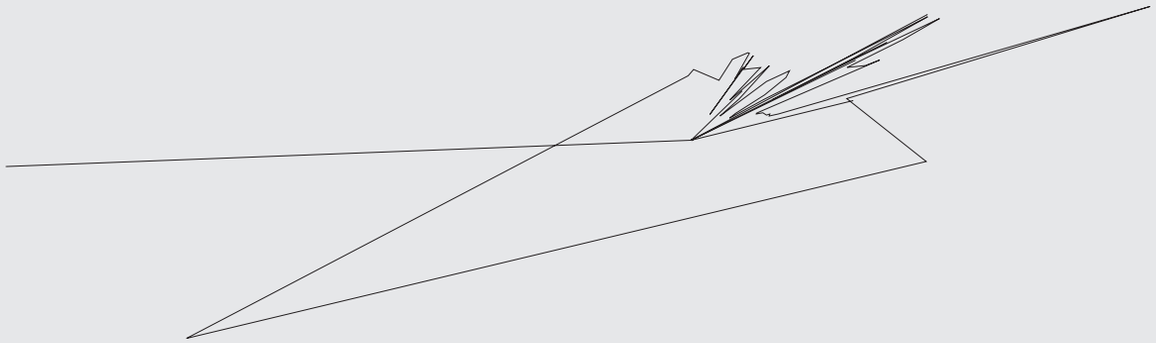
Latvia

Stars: productions touring to foreign cities



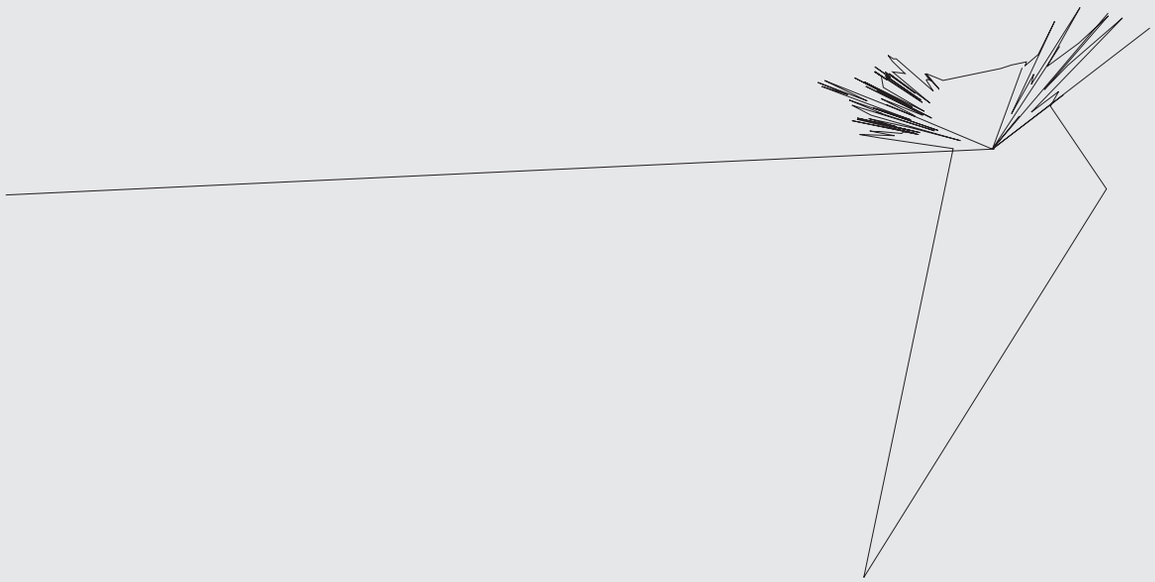
Spain

Stars: productions touring to foreign cities



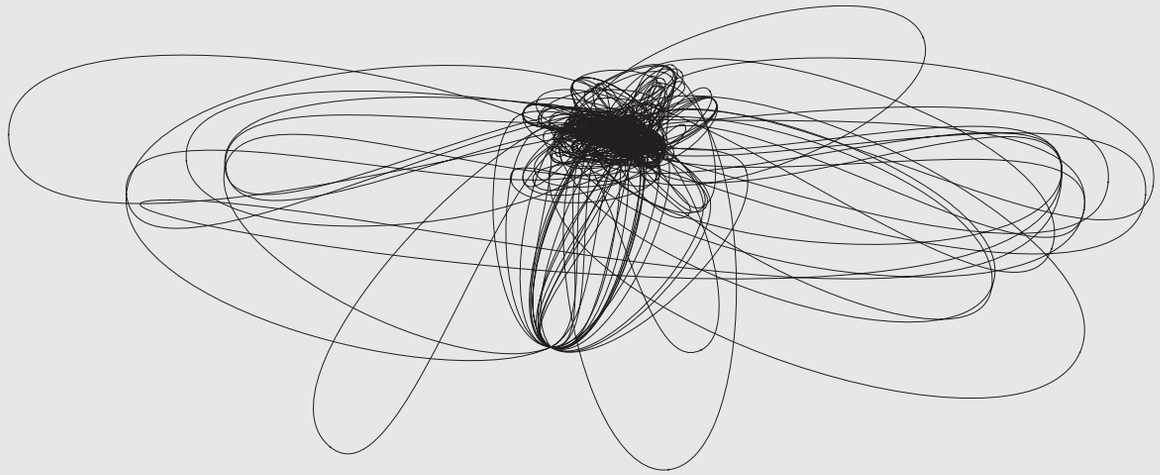
Italy

Stars: productions touring to foreign cities



Hungary

Tours: productions touring to foreign cities

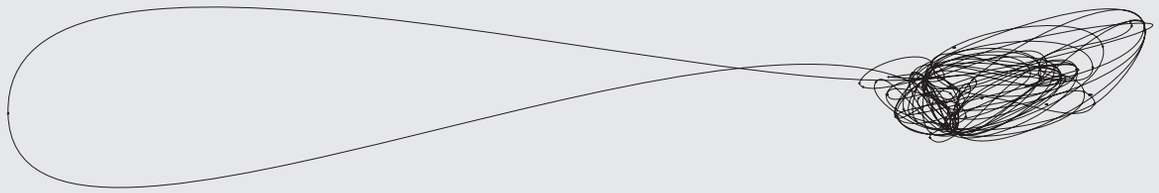


The Netherlands

Tours: productions touring to foreign cities

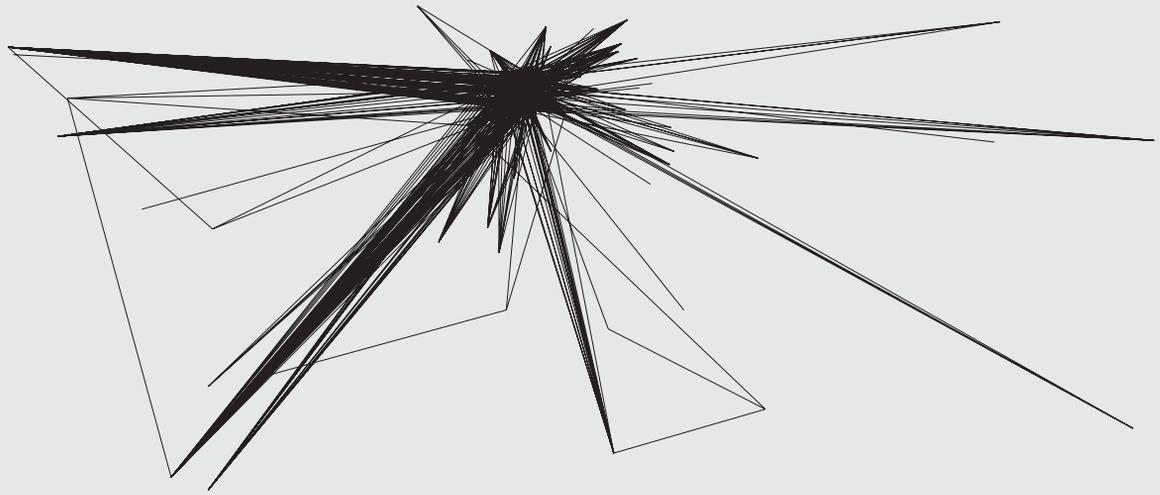
Switzerland

Tours: productions touring to foreign cities



France

Lines: from foreign countries performed in French cities



Slovenia

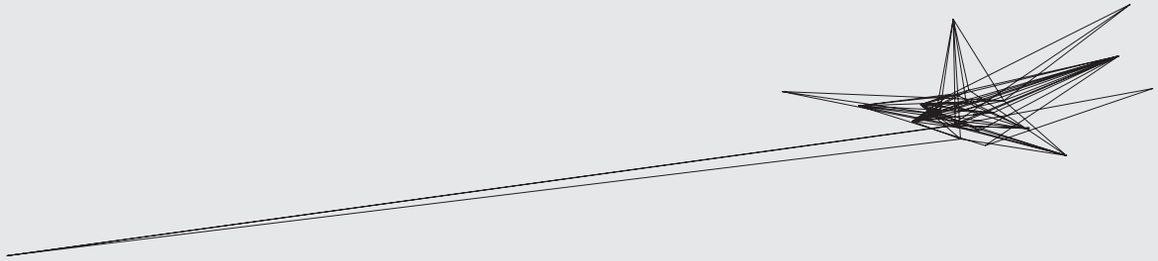
Tours: productions touring to foreign cities

Czech Republic

Lines: from foreign countries performed in Czech cities

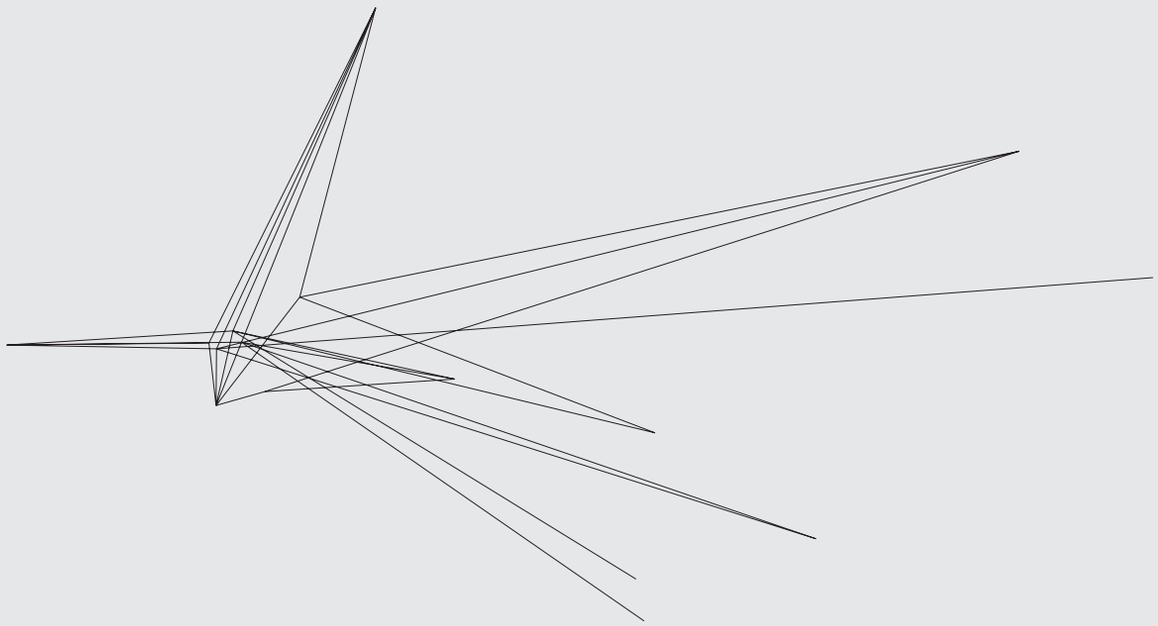
Germany

Lines: from foreign countries performed in German cities



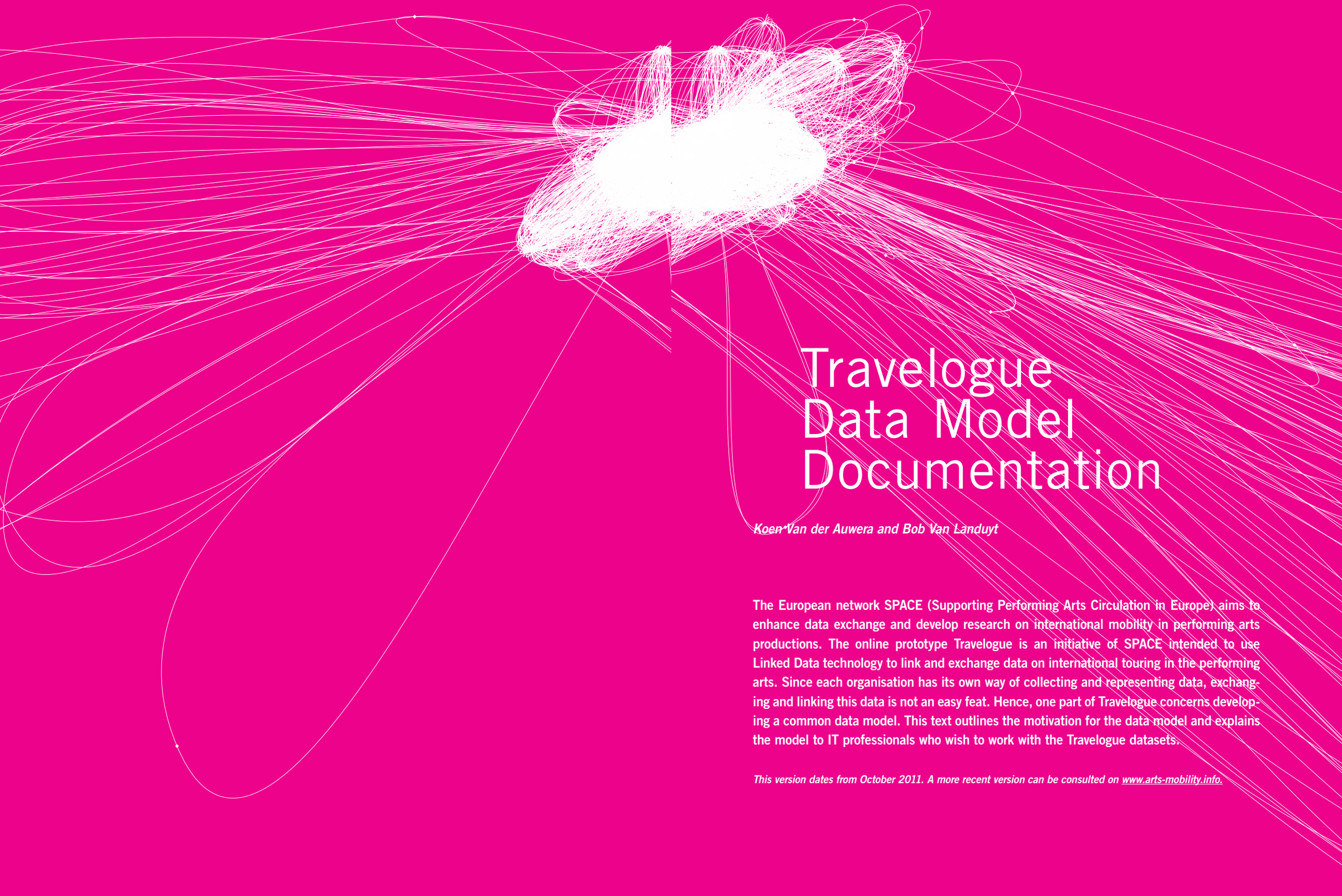
The Netherlands

Lines: from foreign countries performed in Dutch cities



Annex - data sources

Country	Organisation	Dataset
Belarus	Belarus Free Theatre	export theatre 2005-2009
Belgium	VTi	export performing arts 1993-2011
Belgium	Archives et Musée de la Littérature (AML)	export performing arts 2000-2009
Croatia	Croatian centre of ASSITEJ	import & export youth theatre 2006-2009
Czech Republic	Arts Institute - Theatre Institute	import & export performing arts 1930-2007
Denmark	Assitej	export youth theatre 1999-2008
Estonia	Ministry of Culture	import & export performing arts 2006-2008
Finland	Finnish Dance Information Centre	export dance 2003-2007
Finland	Teatterin Tiedotuskeskus	import & export theatre 2007-2008
Finland	Baltic Circle Festival	export Baltic Circle 1997-2006
France	ONDA	import performing arts 2000-2009
Germany	ITI Germany	export dance 2009
Greece	National Theatre Greece	import & export performing arts 2000-2009
Greece	BIOS	import performing arts 2005-2010
Hungary	Hungarian Central Statistical Office	import & export performing arts 2005-2008
Iceland	Leikhopar - Association of Independent Theatres in Iceland	export of independent theatres 2008-2009 & export performing arts 1999-2007
Iceland	Iceland Dance Company	export dance 2001-2008
Ireland	Culture Ireland	export performing arts 2005-2009
Latvia	New Theatre Institute of Latvia	export performing arts 2000-2009
Lithuania	Menofortas	international touringlist Hamlet/Macbeth/ Othello 1997-2008
Lithuania	Lithuanian Dance Information Centre	import dance 2001-2009
Norway	Norwegian Association of Performing Arts (NAPA)	export Ministry of Foreign Affairs travel funds 2003-2008
Poland	Zbigniew Raszewski Theatre Institute (Warsaw Theatre Institute)	import performing arts 2005-2009
Sweden	Swedish Arts Council - Kulturradet	export of state-funded theatre/dance 2006
The Netherlands	Nederlandse Associatie voor Podiumkunsten (NAPK)	export performing arts 2002-2010
Ukraine	Voskresinnia Theatre / Golden Lion Theatre Festival	export Voskresinnia Theatre 1991-2009
United Kingdom	Arts Council England	export performing arts 2008-2009
Georgia, Europe	Tbilisi Opera and Ballet Theatre	export performing arts 2006-2008
Macedonia	Centre for New Initiatives in Arts and Culture	export co-produced performing arts productions 2006-2009
United Kingdom	British Council	export theatre & dance 2008-2009
Portugal	Observatório das Actividades Culturais	export performing arts 2010-2011



Travelogue Data Model Documentation

Koen Van der Auwera and Bob Van Landuyt

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.

This version dates from October 2011. A more recent version can be consulted on www.arts-mobility.info.

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.

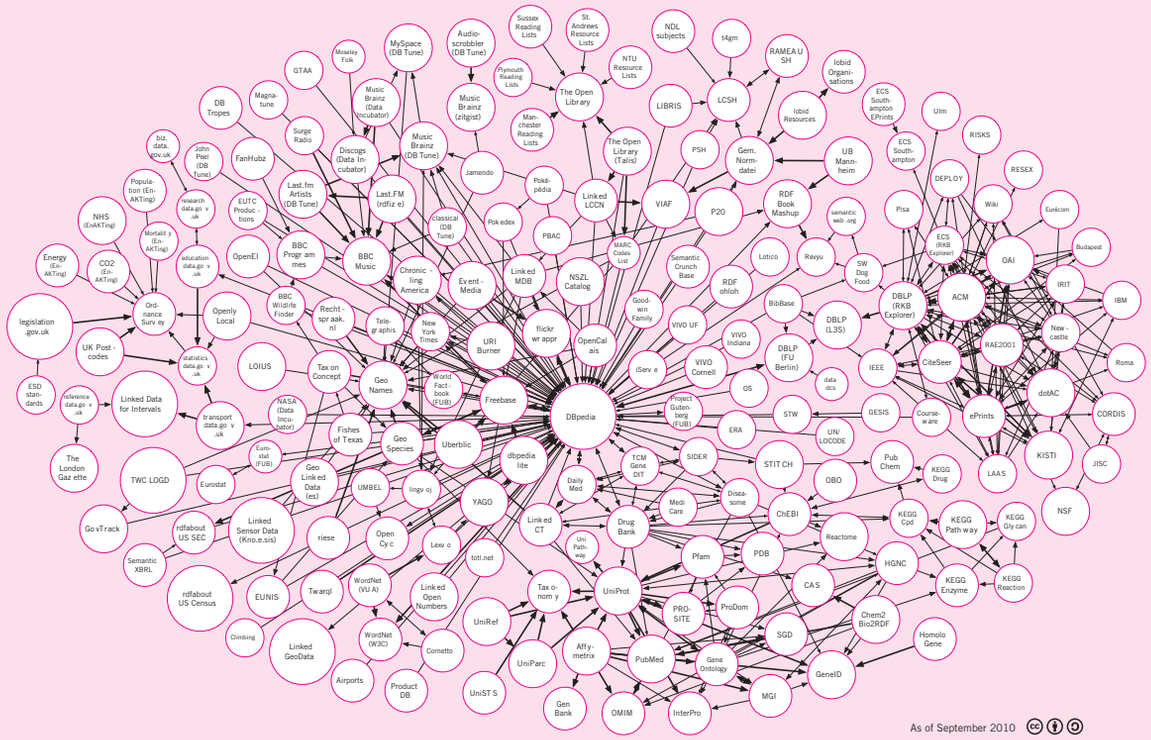
In a W3C (World Wide Web Consortium) memo, Tim Berners-Lee describes the four principles of Linked Data:

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):

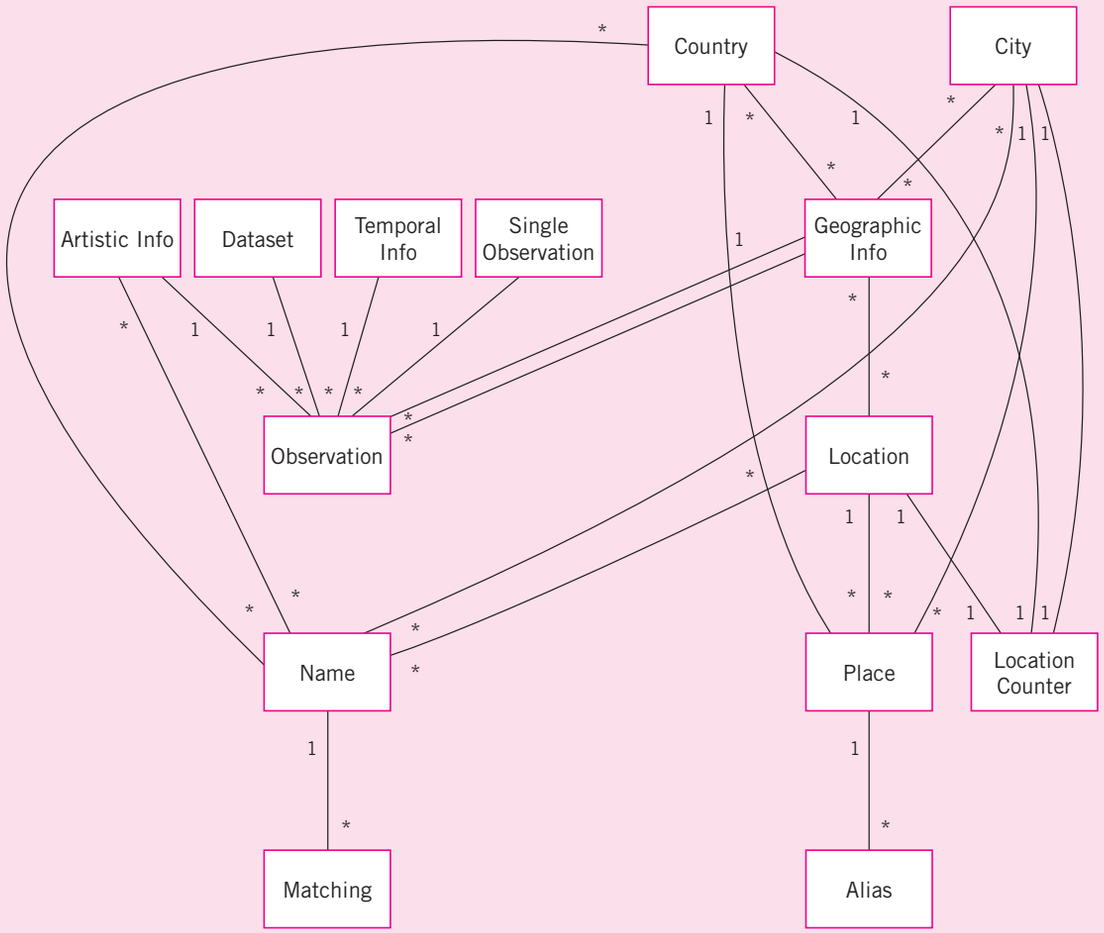
<http://richard.cyganiak.de/foaf.rdf#cygri> <http://xmlns.com/foaf/0.1/based_near> <http://dbpedia.org/resource/Berlin>

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_people_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 occur multiple times.
vocab:geographic_infos_locations	vocab:locations	The location of this Geographic info object. This property can occur multiple times, for example to link the Geographic info object to locations of different granularity, such as one location with the city and one location with the country.
is vocab:locations_geographic_infos of	vocab:locations	The location of this Geographic info object. This property can occur multiple times, for example to link the Geographic info object to locations of different granularity, such as one location with the city and one location 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.

Example: A country

```
<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 *0 [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

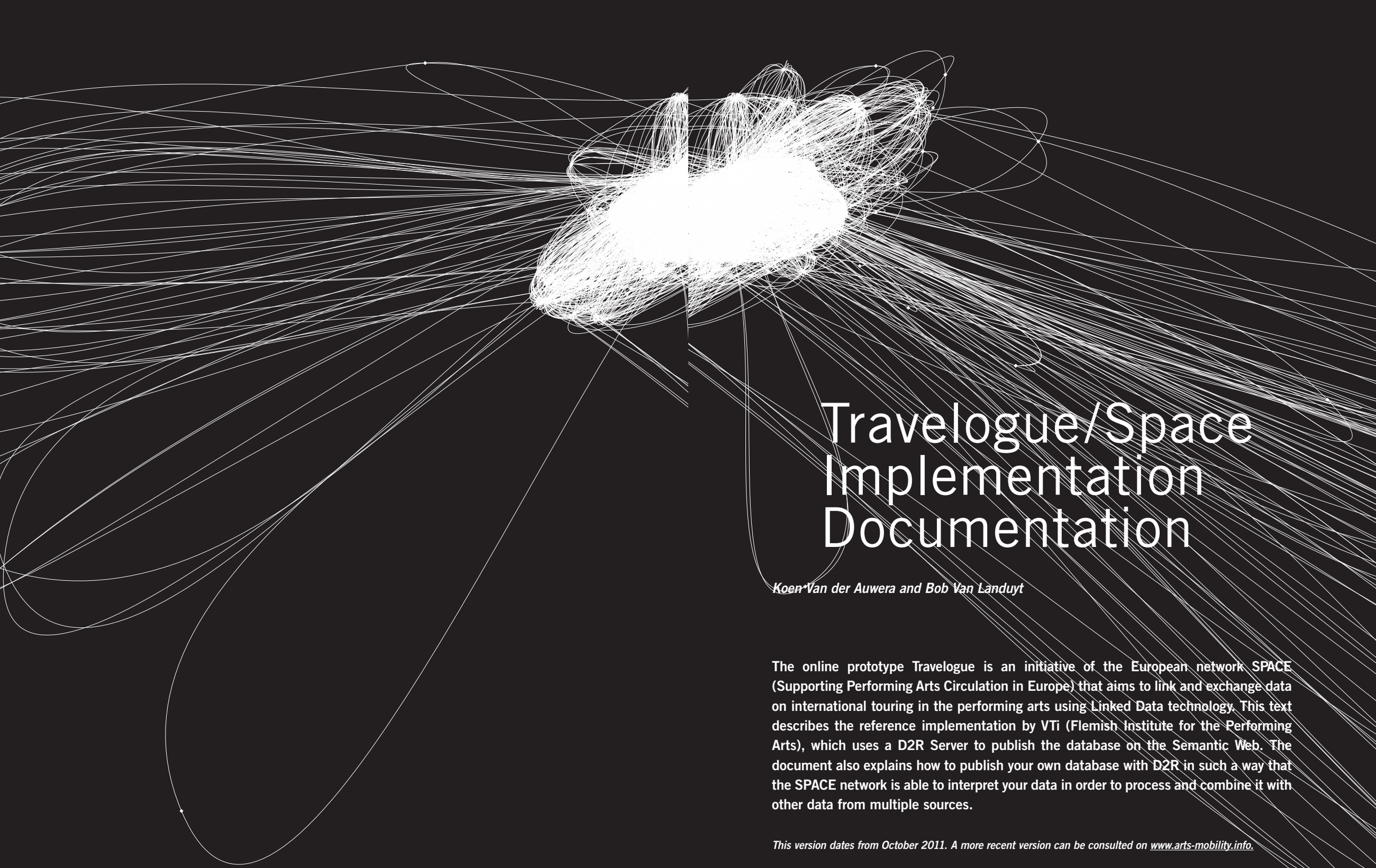
Expanded the examples in “Linked Data as a solution” section.
Added the entities Location and Name and updated the documentation and examples of all entities.

2010-03-08

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

2010-03-04

Initial version of this document.



Travelogue/Space Implementation Documentation

Koen Van der Auwera and Bob Van Landuyt

The online prototype Travelogue is an initiative of the European network SPACE (Supporting Performing Arts Circulation in Europe) that aims to link and exchange data on international touring in the performing arts using Linked Data technology. This text describes the reference implementation by VTi (Flemish Institute for the Performing Arts), which uses a D2R Server to publish the database on the Semantic Web. The document also explains how to publish your own database with D2R in such a way that the SPACE network is able to interpret your data in order to process and combine it with other data from multiple sources.

This version dates from October 2011. A more recent version can be consulted on www.arts-mobility.info.

Requirements

D2R Server

The following components are needed to install the D2R Server:

→ **Java 1.4** or newer. Check this via the command java -version if you are not sure.

→ A **supported database**. We use PostgreSQL, but D2R Server also supports MySQL, Oracle and Microsoft SQL Server. Other databases have not been tested, but any SQL-92 compatible database should work with minor configuration changes. An ODBC data source such as Microsoft Access also works, although with serious limitations. For example, the mapping generator does not work with ODBC.

→ Optionally, a J2EE servlet container as a deployment target. In this document, we run D2R Server as a stand-alone web server, which is the easiest to set up.

→ A **server**. We are running the prototype on a Linux server, more specifically Debian Lenny (5.0). Any server that runs Java and the database of your choice will work. Thi**s D2R** server provides a SPARQL endpoint, which we will use to read and parse the data that is published.

The D2R server files are available here: http://www4.wiwiss.fu-berlin.de/bizer/d2r-server/

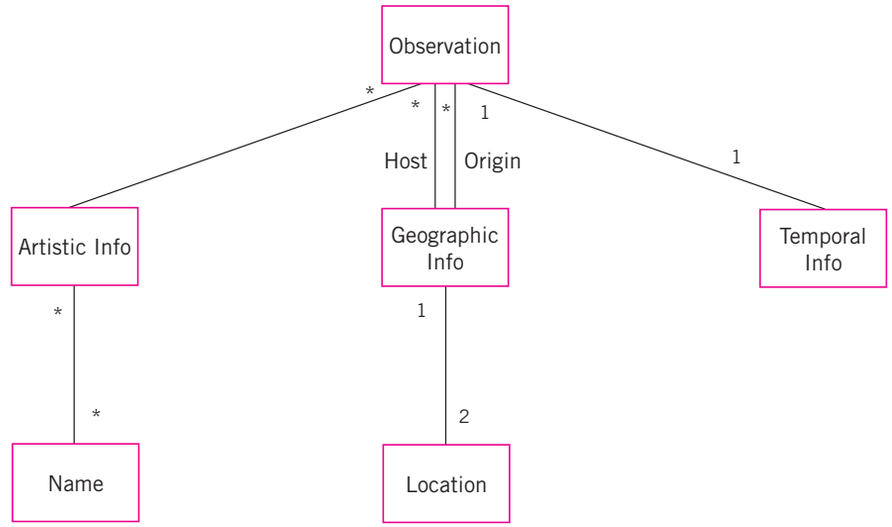
The Database

As described above, a supported relational database is required. If your data is not already contained in such a database, a database can be designed according to the data model described below. Your data can then be imported into the relational database and thus made available on the Semantic Web.

It is also possible to adjust the mapping with custom queries, or database views can be created to make the data available to the D2R server.

The Data Model

The project expects a specific data model and vocabulary in order to read and process your data. Below is the UML diagram of what needs to be made available by the D2R server. Additional vocabularies and properties may be added. They will not interfere with the data used by the SPACE project.



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. The relationships between the observations host and origin geographic info, and its Artistic Info, are more important.

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_screen_display	String	The name of the observation as displayed to users on the screen, which is identical to the rdfs:label property of this object.
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_audiences	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 the ages of 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.
Relation	**Refers to**	
vocab:observations_artistic_infos	vocab:artistic_infos	The URI refering to the artistic info of this particular observation
vocab:observations_host_geographic_info	vocab:geographic_infos	Refers the geographic info object that exported this particular observation
vocab:observations_origin_geographic_infos	vocab:geographic_infos	Refers to the geographic info object this observation was exported to.
vocab:observations_temporal_infos	vocab:temporal_infos	Refers to the date and other temporal info for the observation.

Artistic Info

An Artistic info object represents all the artistic info concerning a certain observation.
This object has a relationship to all the people (artists, authors, producers) responsible for the observation.

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_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. If this property is empty, the observation will be ignored when counting.
vocab:artistic_infos_names	vocab:names	A name of one of the persons responsible for the performance, such as the artist or the 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”.
Relation	**Refers to**	
vocab:artistic_infos_names	vocab:names	This property can occur multiple times. It points to the people who were involved with the production.

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.

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_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.

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. Ideally, one will be of the type “country” and one of the type “city”, but these relationships can be empty, as can the other properties of the Geographic Info object.

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_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.
Relation	**Refers to**	
vocab:geographic_infos_locations	vocab:locations	A location where this Geographic info object is located. This property can occur multiple times, for example to link the Geographic info object to locations of different granularity, such as one location with the city and one location with the country.

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_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” or “Country”.

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 one. 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. Please note that the year property is important for grouping the data.

The following properties are available:

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. This is 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_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_ month 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_m onth is present. Moreover, if this property is present, the property vocab:temporal_infos_year also must be present. Not all Temporal objects have this property.

Mapping the database

The D2R server uses a .n3 mapping file to query data from the database and make it available on the Semantic Web. A default mapping file will be made available with all de classMaps (the different models described above) and their properties. The mapping file then needs to be adapted to suit your database and server configuration.

Configuration

First, a number of prefixes need to be configured. These prefixes are used throughout the mapping and contain information on the mapping and the vocabularies used. If you wish to add additional information in other vocabularies, these can be defined here. In the mapping for SPACE, we only need to complete two prefixes:

```
@prefix map: <file:name-of-your-mapping.n3#> .
@prefix vocab: <http://your-host/vocab/resource/> .
```

The map prefix refers to our mapping file. The second “vocab” prefix tells the D2R server where the descriptions of the different (custom) vocabularies can be found. This allows us to use “vocab:observations” to refer to the class description of, for example, observations. By default, SPACE expects its resource definitions to be at the URL “/vocab/resource”. If a different location is used, this needs to be configured. Then we can add the configuration for our database:

```
map:database a d2rq:Database;
   d2rq:jdbcDriver “org.postgresql.Driver”;
   d2rq:jdbcDSN “jdbc:postgresql:database-name”;
   d2rq:username “your-username”;
   d2rq:password “your-pass”;
```

The first setting “jdbcDriver” specifies the driver we are using, in this case PostgreSQL. The default is MySQL, so if you are using MySQL, there is no need to include this property. The next setting specifies the database to be connected to. Together with the username and password, this allows the connection to the database to be made. The server itself can be configured as follows:

```
<> a d2r:Server;
   rdfs:label “Label for your server”;
   d2r:baseURI <http://your-host/>;
   d2r:port 80;
   d2r:vocabularyIncludeInstances true;
```

The label property sets the title of the web interface for the D2R server. The baseURI is used as base for all the “uriPatterns” used in the mapping. The port specifies the port on which the server is made available. The last property indicates whether or not the type is included in the several classmaps. Although not strictly necessary, it is recommended to leave this set to “true”, which is why the description of each classmap is included.

Mapping the database

When mapping a class, we first must define it using the following declaration:

```
map:locations a d2rq:ClassMap;
   d2rq:dataStorage map:database;
   d2rq:uriPattern “locations/@@production.locations.permalink@@”;
   d2rq:class vocab:locations;
   d2rq:classDefinitionLabel “locations”;
```

After the “map:” prefix, the name of the class is defined. The uriPattern refers to the URI where the objects can be found, which is also based on the “baseURI” setting that was specified earlier. Make sure that the value used in the URI is unique for every record in the database, otherwise only the first record will be available. The class property sets the vocabulary used. The classDefinitionLabel is a humanly readable name for the class. Each class needs to be defined in this way before properties can be assigned.

A label can also be defined for each class. This label ensures that humanly readable links are available in the D2R web interface. When there is no label specified for a class, the “uriPattern” is used. A label can be specified as follows:

```
map:locations__label a d2rq:PropertyBridge;
   d2rq:belongsToClassMap map:locations;
   d2rq:property rdfs:label;
   d2rq:pattern “@@production.locations.name@@”;
```

Properties for the classes can be defined as follows:

```
map:locations_name a d2rq:PropertyBridge;
   d2rq:belongsToClassMap map:locations;
   d2rq:property vocab:locations_name;
   d2rq:propertyDefinitionLabel “locations name”;
   d2rq:column “production.locations.name”;
```

If your database differs from the model described and the value cannot be retrieved from a column, it is also possible to write JOIN properties such as this:

```
map:temporal_infos_start_at a d2rq:PropertyBridge;
   d2rq:belongsToClassMap map:temporal_infos;
   d2rq:property vocab:temporal_infos_start_at;
   d2rq:propertyDefinitionLabel “temporal_infos start_at”;
   d2rq:join “production.shows.date_id = production.date_isaars.id”;
   d2rq:column “production.shows.time”;
```

If necessary, more complex queries can be made to the database:

```
map:observations_nr_of_people_on_tour a d2rq:PropertyBridge;
   d2rq:belongsToClassMap map:observations;
   d2rq:property vocab:observations_nr_of_people_on_tour;
   d2rq:propertyDefinitionLabel “observations nr_of_people_on_tour”;
   d2rq:join “production.shows.organisation_id =
production.organisations.id”;
   d2rq:join “production.alumni.organisation_id =
production.organisations.id”;
   d2rq:sqlExpression “COUNT(DISTINCT(production.alumni.person_id))”;
   d2rq:datatype xsd:int;
```

It is also possible to define SQL “where” conditions using “d2qr:condition”. If your database structure differs too much, it is also possible to create database views and obtain the necessary data from these views.

Relationships between the different classmaps can be defined as follows:

```
map:observations_artistic_info a d2rq:PropertyBridge;
   d2rq:belongsToClassMap map:observations;
   d2rq:property vocab:observations_artistic_info;
   d2rq:refersToClassMap map:artistic_infos;
   d2rq:join “production.artistic_infos.production_id =
production.shows.production_id”;
```

Useful links

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

D2RQ mapping language: http://www4.wiwiss.fu-berlin.de/bizer/d2rq/spec/

SPARQL query language: http://www.w3.org/TR/rdf-sparql-query/

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 umění - 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

Joris Janssens has been director of the *Vlaams Theater Instituut* (Flemish Institute for the Performing Arts) since 2011, where he conducts research on performing arts and cultural policies in Flanders. He has published several books and articles on artistic practice and diversity, international work, cultural infrastructure, art, populism and popular culture. He holds a Ph.D. in Linguistics and Literature: Germanic Languages from the KU Leuven. He worked at the KU Leuven (Department of Literature, Netherlandish Studies) from 1997-2001. He also worked at the University of Vienna in 2001 for the Department of Netherlandish Studies.

Bart Magnus studied Germanic Languages (Dutch/English), teacher training and has a master's degree in Theatre Studies. After two editions of *Het Theaterfestival* (the first of which as a trainee) he started at VTi in 2009 as a collaborator in the SPACE project. In July 2010, he was appointed head of performing arts documentation at *Vlaams Theater Instituut* (Flemish Institute for the Performing Arts).

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.

About the designers

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.

Pierre Huyghebaert is currently the driving force behind the design studio Speculoos, where he makes use of a range of graphic design practices. His interests include using free software to learn to work differently and collaboratively on cartography, type design, web interface, schematic illustration, book design, and the teaching of these practices. In addition to participating in OSP (osp.constantvzw.org), he articulates residential spaces and narratives through the temporary artists' alliance Potential Estate (www.potentialestate.org) and he develops collaborative and subjective mapping in collaboration with Towards (www.towards.be) and other urban projects in Brussels.

Pierre Marchand is neither a programmer, a cartographer, nor an artist, or maybe he's all three. He contributes to large projects such as Scribus desktop publishing software, and has launched his own projects such as FontMatrix, a font management system, and Fonzie, a scan to font application allowing multiple drawings for a single character.

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