January 10th, 2012

CERIF 1.3 XML

Data Exchange Format Specification

Towards the next Release

Editors:

Brigitte Jörg	DFKI GmbH, Berlin, Germany
Jan Dvořák	InfoScience, Praha, Czech Republic
Thomas Vestdam	atira, Aalborg, Denmark
Geert van Grootel	Flemish Government, Brussels, Belgium
Keith Jeffery	Science and Technology Facilities Council, Didcot, UK
Anna Clements	University of St. Andrews, St. Andrews, Scotland

Note: *The CERIF 1.3 XML Data Exchange Format Specification Document has not been changed, because functionally the CERIF XML has not changed with the latest update. With the next release* ***there will be a substantial update*** *of the CERIF XML Format Specification, which is* ***currently being tested*** *within the community.*

If you wish to get the latest developments, have a look at the CERIF forum area and be in touch with the taskgroup.

1.1 CERIF 1.3 Components[1]

The current CERIF 1.3 release comprises the following components:

- CERIF – 1.3 FDM: Model Introduction and Specification
  separate document available from the website

- CERIF 1.3 FDM: SQL scripts for most common databases
  available for members only

- CERIF – 1.3 XML: Data Exchange Format Specification
  this document

- CERIF – 1.3 XML Examples
  available for members only

- CERIF – 1.3 XML Schema Files
  CERIF XML validation files available from the website
  http://www.eurocris.org/Uploads/Web%20pages/CERIF-1.3/XML-SCHEMAS/

- CERIF – 1.3 Semantics: Research Vocabulary
  separate document available from the website

- CERIF 1.3 Vocabulary
  available as Excel file from the website
  http://www.eurocris.org/Uploads/Web%20pages/CERIF-1.3/Semantics/CERIF1.3_Vocabulary.xls
  and (embedded) CERIF XML (currently for Members only)

Additional CERIF–1.3 related files and more documents or background information about CERIF and CRISs are available for downloaded from the euroCRIS website: http://www.eurocris.org/.

Status:
The remainder of this document has not been changed, whereas the XML Examples and XML Schema files have been updated with the CERIF 1.3 model.

Location:
http://www.eurocris.org/Uploads/Web%20pages/CERIF-1.3/Specifications/CERIF1.3_XML.pdf

---

[1] CERIF–1.3 was modeled with Toad Data Modeler by Quest Software[1], which allows to draw ERM diagrams, to generate SQL scripts for most common databases (Oracle, Microsoft, IBM, etc.), to reverse engineer from databases, to create screenshots of the model and model parts, and to model at physical and logical level. The resulting CERIF SQL scripts are generated automatically from the physical level.

CERIF 2008 – 1.2 XML
Data Exchange Format Specification

Editors:

Brigitte Jörg	DFKI GmbH, Berlin, Germany
Geert van Grootel	Flemish Government, Brussels, Belgium
Keith Jeffery	Science and Technology Facilities Council, Didcot, UK
Jan Dvorak	InfoScience, Prague, Czech Republic

Abstract:
The CERIF 2008–1.2 XML Data Exchange Format Specification is one component of the CERIF 2008–1.2 Full Data Model (FDM) release. It aims to support consistent and quality XML data interchange across systems and applications, based on the CERIF 2008-1.2 model. With this document we present the latest CERIF XML specification, and recommend the organisation of CERIF XML files accordingly. The CERIF XML Data Exchange Format conforms to W3C recommendation.

CERIF (the **C**ommon **E**uropean **R**esearch **I**nformation **F**ormat) is a formal conceptual model to support the management of Research Information, including the set up of and the interoperation between Research Information Systems. The CERIF model is considered a standard; recommended by the European Union to its Member States. It has been developed with support by the European Commission in two major phases: 1987-1990 and 1997-1999. In 2000 the European Commission handed over care and custody of CERIF to euroCRIS (www.eurocris.org) a not-for-profit organization dedicated to the promotion of **C**urrent **R**esearch **I**nformation **S**ystems (CRISs).

Status:
CERIF model improvements are based on discussions among euroCRIS CERIF task group members. This document is considered final in the CERIF 2008 series.

Location:
http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/CERIF2008_1.2_XML.pdf

Table of Contents

2. Introduction

The CERIF XML Interchange Format is one component of the CERIF 2008–1.2 Full Data Model (FDM). It is intended to support and enable consistent and quality data interchange across systems and applications. CERIF XML builds on the widely known and popular XML format, recommended by the W3C [3]. With the CERIF 2008–1.2 Full Data Model Introduction and Specification document, the CERIF model has been conceptually structured into entity types and features [1]. In between the types we distinguish base, result, link and 2nd level entities, as features we consider multilinguality and semantics. This conceptual structure is also represented by colors in all model related documents and screenshots. For more information about CERIF types and features we refer to [1]. With this document, we distinguish the CERIF entities and features accordingly.

CERIF Entity Types	CERIF Features
Base Entities [base]	Multiple Language [lang]
Result Entities [result]	Semantics [class]*
2nd Level Entities [2nd]	
Link Entities [link]	Additional [add]

This presented conceptual structure is only a virtual structure and as such not inherent in the physical data model, and therefore also not incorporated with the SQL scripts and the physical representation of CERIF XML content. However, it supports the management of the CERIF XML files; in particular their ordering as recommended, during data interchanges. The list of conceptually structured CERIF entities is attached in the Appendix. Figure 1 shows the base, result and 2nd level CERIF entities, and their relationships from an abstract perspective. For a deeper insight to the physical level, including attributes, data types and keys, we refer to the screenshots in [1].

* The currently defined CERIF core is not part of the conceptual CERIF Model, but considered a filler (content) of the conceptual CERIF Semantic Layer. The current core CERIF Semantics 2008-1.2 represents a common research context in a formal way [2].

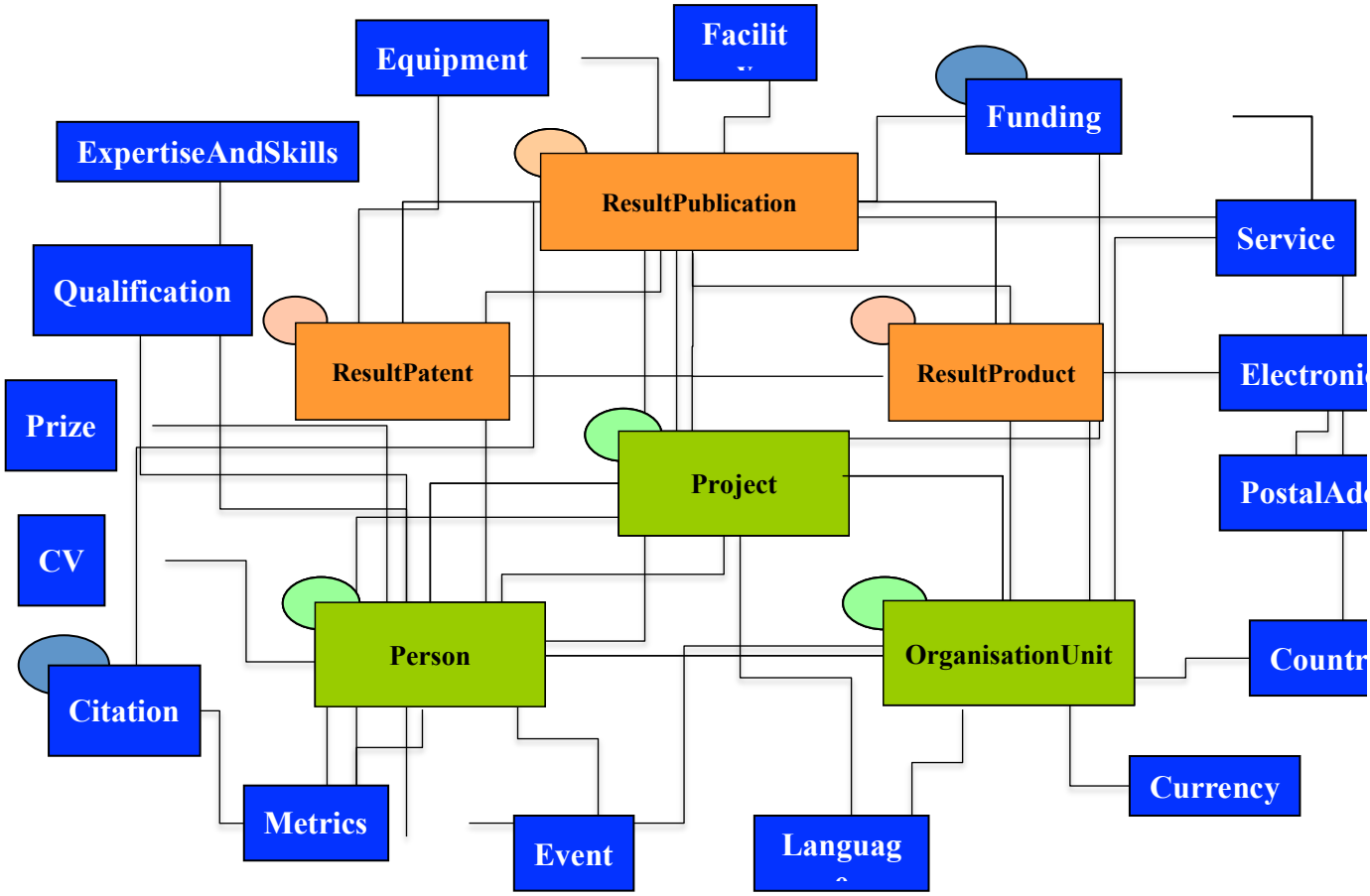

Figure 1: CERIF 2008 – 1.1 entities and some relationships

A CERIF-based XML interchange happens with operations at the physical level and therefore conforms to the naming of CERIF entities and attributes at physical level, that is: short names (i.e. cfPers, cfOrgUnit, cfResPubl). Because in some databases the length of a table name is restricted to a particular number of characters, we have shortened the table names at physical level to ensure the consistency of the CERIF SQL scripts across database systems by avoiding uncontrolled truncations. The table names are still understandable by human readers. Every table name includes a prefix 'cf' for CERIF.

2.1 Purpose of CERIF XML

CERIF XML aims to support and enable consistency and quality data interchanges across Research Information related applications and between data providers by offering a structured, and modularized XML format based on the CERIF model.

2.2 Scope of CERIF XML

The CERIF 2008–1.2 XML Data Exchange and Format Specification includes CERIF XML examples and corresponding CERIF XML Schema files for the validation of CERIF XML Exchange files. The CERIF XML component is considered a 1:1 representation of the entire CERIF ERM Model and therefore inherits the same relational structure.

2.3 CERIF Components

The current CERIF 2008 – 1.2 release comprises the following components:

- CERIF 2008 – 1.2 FDM: Model Introduction and Specification
  separate document available from the website [1]

- CERIF 2008 – 1.2 FDM: SQL scripts for most common databases
  available for members only

- CERIF 2008 – 1.2 XML: Data Exchange Format Specification
  this document

- CERIF 2008 – 1.2 XML Examples
  available for members only

- CERIF 2008 – 1.2 XML Schema Files
  CERIF XML validation files available from the website
  http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/XML-SCHEMAS/

- CERIF 2008 – 1.2 Semantics
  separate document available from the website [2]

CERIF 2008–1.2 related files and more documents and background information about CERIF and CRISs can be downloaded from the euroCRIS website: http://www.eurocris.org/. The physical SQL scripts and XML examples files are available for members only[2].

3. CERIF XML File Production

The following steps describe in brief a possible process to produce CERIF XML files from CERIF-based databases according to the conceptual structure as introduced in the specification document "CERIF 2008–1.2 Full Data Model – Introduction and Specification" [1], and indicated in the introduction of this document. A full list of the CERIF entities, and some CERIF XML examples have been provided with the appendix. The XML examples and SQL scripts can be downloaded from the internal euroCRIS website.

Step 0: Naming of CERIF XML Files

We recommend that the names of CERIF XML files indicate the entity name (at physical level the table name), and the entity type or feature (base, 2nd, link, lang, class, add). To ensure data integrity during the import process, the CERIF XML files should follow this naming convention and we recommend the following order for a file generation:

(1) XML File Names for CERIF Classification Entities
- cfClass-CLASS.xml
- cfClassScheme-CLASS.xml

(2) XML File Names for 2nd Level CERIF Entities
- cfService-2ND.xml
- cfCurrency-2ND.xml
- cfCountry-2ND.xml
- cfLang-2ND.xml

[2] The CERIF 2008–1.2 release was modeled with Toad Data Modeler by Quest Software[2] which allows to draw ERM diagrams, to generate SQL scripts for most common databases (Oracle, Microsoft, IBM, etc.), to reverse engineer from databases, to create screenshots of the model and model parts, and to model at physical and logical level. The resulting CERIF SQL scripts are generated automatically from the physical level.

- cfCV-2ND.xml
- cfEvent-2ND.xml
- …

(3) XML File Names for Base CERIF Entities
- cfPers-BASE.xml
- cfProj-BASE.xml
- cfOrgUnit-BASE.xml

(4) XML File Names for CERIF Result Entities
- cfResPubl-RES.xml
- cfResPat-RES.xml
- cfResProd-RES.xml

(5) XML File Names for CERIF Link Entities
- cfPers_OrgUnit-LINK.xml
- cfProj_Pers-LINK.xml
- cfProj_Class-LINK.xml
- cfProj_Equip-LINK.xml
- cfClass_Class-LINK.xml
- cfCV_Class-LINK.xml
- …

(6) XML File Names for Language-dependent CERIF Entities
- cfProjAbstr-LANG.xml
- cfProjTitle-LANG.xml
- cfClassDescr-LANG.xml
- cfClassTerm-LANG.xml
- …

(7) XML File Names for Additional CERIF Entities
- cfPersName-ADD.xml
- cfDC-ADD.xml
- …

Step 1: XML Header

For all CERIF XML files the default XML version and a UTF-8 encoding has to be defined to support Unicode and thus allow for character sets of different languages.

```
<?xml version="1.0" encoding="UTF-8"?>
```

Step 2: XML Root Element CERIF

Additional to the XML header, each CERIF XML file contains a CERIF root element. The

CERIF root element nests all entity-related information of individual source databases. For a validation of the nested data the schema reference ***xsi:schemaLocation*** has to be added according to W3C standards. Moreover, according to W3C convention, namespace references ***xmlns; xmlns:xsi*** have to be added at the same level. To identify the one CERIF release to which the data belong to, the date at which the data were produced and the source database of the data, ***release***, ***date*** and ***sourceDatabase*** attributes are mandatory.

```
<?xml version="1.0" encoding="UTF-8"?>
<CERIF
  xsi:schemaLocation="http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/XML-SCHEMAS/
                      cfEntityName-EntityType http://www.eurocris.org/Uploads/
                      http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/XML-SCHEMAS/
                      cfEntityName-EntityType.xsd"
  xmlns=" http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/XML-SCHEMAS/cfEntityName-EntityType"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  release="2008-1.2"  date="2010-11-20" sourceDatabase="name of source db">

   < CERIF XML Data
     - per entity and
     - per source database
     - recommended! >

</CERIF>
```

Step 3: CERIF XML Structure

We strongly recommend to create CERIF XML files as many XML files, containing **only per entity** (cfPers, cfOrgUnit, cfProj, …) **data**, and per source database data. A single CERIF XML file mixing data for all CERIF entities cannot be validated with the provided CERIF XML Schema files. In particular, the complexity of the structure, but also the size of the file would become a serious problem when containing all data within one large XML file. For reasons of simplicity, and for ease of validation, error detection and data integrity we strongly recommend to create per entity structured XML files corresponding to single CERIF entities. The presented examples in this document only show per entity structured XML records.

Each CERIF XML file contains the CERIF root element nesting the entity elements (i.e. cfPers, cfOrgUnit, cfFacil, etc); each entity element is prefixed with cf, corresponding to the physical names of the CERIF tables.

```
<?xml version="1.0" encoding="UTF-8"?>
<CERIF …>
   <cfPers>
     …
   </cfPers>
   <cfPers>
     …
   </cfPers>
</CERIF>
```

CERIF XML example structure for person records in the file cfPers-BASE.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<CERIF …>
   <cfOrgUnit>
     …
   </cfOrgUnit>
   <cfOrgUnit>
     …
   </cfOrgUnit>
</CERIF>
```

CERIF XML example file for organization records in the file cfOrgUnit-BASE.xml

At the record level, each XML entity element nests the table attributes (cfId, cfURI, …) as XML elements.

```
<?xml version="1.0" encoding="UTF-8"?>
<CERIF …>
   <cfPers>
     <cfPersId>ID1</cfPersId>
     <cfURI>http://www.dfki.de/~brigitte</cfURI>
     <cfSex>f</cfSex>
   </cfPers>
   <cfPers>
```

```
    <cfPersId>ID2</cfPersId>
    <cfURI>http://www.anyhomepageurl.org/</cfURI>
    <cfBirthdate>1970-01-07</cfBirthdate>
    <cfSex>m</cfSex>
  </cfPers>
</CERIF>
```

CERIF XML example file for person records in the file cfPers-BASE.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<CERIF …>
  <cfPersResInt>
    <cfPersId>ID1</cfPersId>
    <cfResInt cfLangCode="DE" cfTrans="o">Brigitte Jörg interessiert sich für Forschungsinformationssysteme,
      deren Modellierung und Represäntation sowie deren formale Semantik. Darüberhinaus beschäftigt sie sich
      mit ontologiebasierten Wissenschaftsinformationssystemen.
    </cfResInt>
  </cfPersResInt>
  <cfPersResInt>
    <cfPersId>ID1</cfPersId>
    <cfResInt cfLangCode="EN" cfTrans="o">Brigitte Jörg is interested in CRISs, conceptual modelling and
     knowledge (ontology) engineering.
  </cfResInt>
  </cfPersResInt>
</CERIF>
```

CERIF XML example file for person research interest records in the file cfPersResInt-LANG.xml

```
<?xml version="1.0" encoding="UTF-8"?>
<CERIF …>
  <cfPersKeyw>
    <cfPersId>ID1</cfPersId>
    <cfKeyw cfLangCode="DE" cfTrans="o">Wissenschaftsinformationssysteme; Modellierung</cfKeyw>
  <cfPersKeyw>
  <cfPersKeyw>
    <cfPersId>ID1</cfPersId>
    <cfKeyw cfLangCode="EN" cfTrans="o">CRIS; Conceptual Modeling; Ontology Engineering</cfKeyw>
  <cfPersKeyw>
</CERIF>
```

CERIF XML example file for person keyword records in the file cfPersResKeyw-LANG.xml

Step 4: CERIF Entities –> CERIF XML Entities

(1) Base Entities become Base XML Entities

The transformation of a base entity into a base CERIF XML entity is demonstrated with the base entity **person (cfPers)** that becomes a base CERIF XML entity **<cfPers>** nesting the attributes accordingly. The entity attributes become XML elements nested within the base elements. The attribute values become XML element values; empty attributes are omitted.

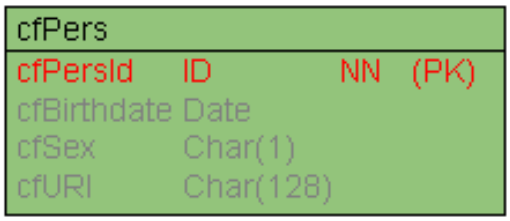

Figure 2: CERIF Person entity structure

```
<cfPers>
   <cfPersId>ID</cfPersId>
   <cfBirtdate>Date</cfBirthdate>
   <cfURI>String</cfURI>
   <cfSex>Selection</cfSex>
</cfPers>
```

cfPers-BASE.xml record structure

(2) Result Entities become Result XML Entities

The transformation of a result entity into a result CERIF XML entity is demonstrated with the result entity **publication (cfResPubl)** that becomes a result XML entity **<cfResPubl>** nesting the attributes accordingly. The entity attributes become XML elements nested within the result elements. The attribute values become XML element values; empty attributes are omitted.

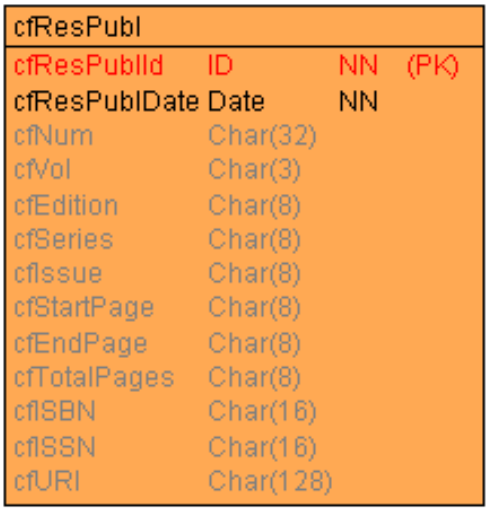

Figure 3: CERIF Result Publication entity structure

```
<cfResPubl>
   <cfResPublId>ID</cfResPublId>
   <cfURI>String</cfURI>
   <cfResPublDate>Date</cfResPublDate>
   <cfNum>String</cfNum>
   <cfVol>String</cfVol>
   <cfEdition>String</cfEdition>
   <cfSeries>String</cfSeries>
   <cfIssue>String</cfIssue>
   <cfStartPage>String</cfStartPage>
   <cfEndPage>String</cfEndPage>
   <cfTotalPages>String</cfTotalPages>
   <cfISBN>String</cfISBN>
   <cfISSN>String</cfISSN>
</cfResPubl>
```

cfResPubl-RES.xml record structure

(3) 2nd Level Entitiess become 2nd Level XML Entites

The transformation of 2nd level entities into 2nd level XML entities is equal to the transformation of the base and result entities and is demonstrated with the 2nd level entity

event (cfEvent) that becomes a 2nd level XML entity **<cfEvent>** nesting related information. The entity attributes become XML elements nested within the entity elements. The attribute values become XML element values; empty attributes are omitted.

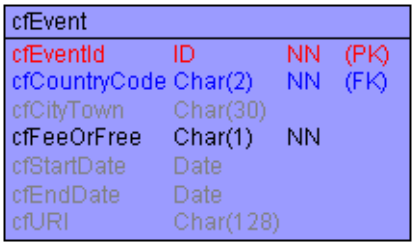

Figure 4: CERIF Event entity structure

```
<cfEvent>
    <cfEventId>ID</cfEventId>
    <cfURI>String</cfURI>
    <cfLocation>String</cfLocation>
    <cfFeeOrFree>String</cfFeeOrFree>
    <cfStartDate>Date</cfStartDate>
    <cfEndDate>Date</cfEndDate>
    </cfEvent>
<cfEvent>
```

cfEvent-2ND.xml record structure

(4) Link Entities become XML Link Entites

The transformation of CERIF link entities into CERIF XML link entities is demonstrated with the link table **Person_Organisation (cfPers_OrgUnit)** that becomes an XML link entity **<cfPers_OrgUnit>** nesting the attributes accordingly. The entity attributes become XML elements nested within XML entity elements.

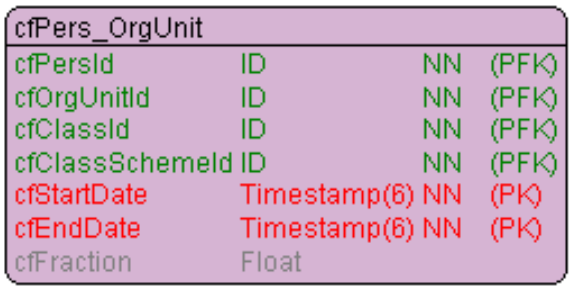

Figure 5: CERIF Person_OrgUnit entity structure

```
<cfPers_OrgUnit>
    <cfPersId>ID</cfPersId>
    <cfOrgUnitId>ID</cfOrgUnitId>
    <cfClassId>ID</cfClassId>
    <cfClassSchemeId>ID</cfClassSchemeId>
    <cfFraction>Float</cfFraction>
    <cfStartDate>Timestamp</cfStartDate>
    <cfEndDate>Timestamp</cfEndDate>
</cfPers_OrgUnit>
```

cfPers_OrgUnit-LINK.xml record structure

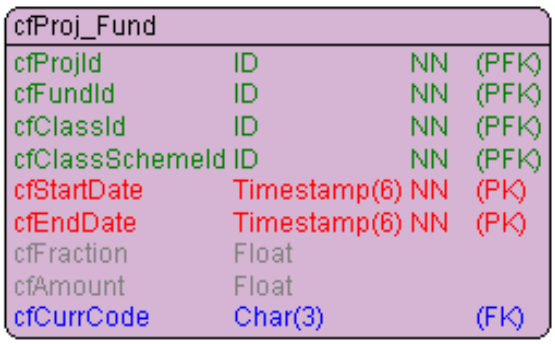

Figure 6: CERIF Project_Funding entity structure

```
<cfProj_Fund>
    <cfProjId>ID</cfProjId>
    <cfFundId>ID</cfFundId>
    <cfClassId>ID</cfClassId>
    <cfClassSchemeId>ID</cfClassSchemeId>
    <cfFraction>Float</cfFraction>
    <cfStartDate>Timestamp</cfStartDate>
    <cfEndDate>Timestamp</cfEndDate>
    <cfAmount cfCurrencyCode="EUR">Float</cfAmount>
</cfProj_Fund>
```

cfProj_Fund-LINK.xml record structure

Attribute values become XML element values, except from cfCurrCode attributes, which are transformed into XML attributes within currency-dependent elements, in order to be associated correctly with their intension; empty attributes are omitted. Each link entity contains references to the classification and classification scheme entity (semantic layer) [1, 2]. For all CERIF link entities, a classification id (cfClassId) and its associated classification scheme id (cfClassSchemeId) as well as a time stamp cfStartDate/cfEndDate are mandatory. A cfFraction attribute may be assigned for fractional values being added to classification references.

(5) Language-dependent Entities become Language-dependent XML Entities

The transformation of language-dependent entities into language-dependent XML entities is demonstrated with the entity **OrgUnitResearchActivity (cfOrgUnitResAct)** that becomes a language-dependent XML entity **<cfOrgUnitResAct>** nesting the attributes accordingly. Language entity attributes become XML elements nested within the entity elements except from cfLangCode and cfTrans, which are transformed into attributes within XML elements in order to be associated correctly with the values. Attribute values become XML element values except from cfLangCode and cfTrans values, which become values of attributes inside their corresponding elements; empty attributes are omitted.

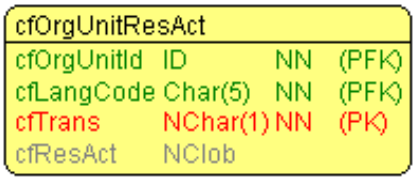

Figure 7: CERIF OrganisationUnit ResearchActivity entity structure

```
<cfOrgUnitResAct>
   <cfOrgUnitId>ID</cfOrgUnitId>
   <cfResAct cfLangCode="DE" cfTrans="o">String</cfResAct>
</cfOrgUnitResAct>
```

cfOrgUnitResAct-LANG.xml record structure

(6) Classification Entities become XML Classification Entities

The transformation of classification entities into XML classification entities is demonstrated with the entity **Classification (cfClass)** that becomes a XML class entity **<cfClass>** nesting related information. Class entity attributes become XML elements nested within XML entity elements. The attribute values become XML element values; empty attribute are omitted.

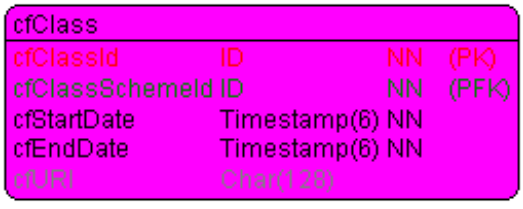

Figure 8: CERIF Classification table

```
<cfClass>
        <cfClassId>ID</cfClassId>
        <cfClassSchemeId>ID</cfClassSchemeId>
        <cfStartDate>Timestamp</cfStartDate>
        <cfEndDate>Timestamp</cfEndDate>
        <cfURI>String</cfURI>
</cfClass>
```

cfClass-CLASS.xml record structure

CERIF XML operates at a purely technical operation and representation level. More detailed information about the entire CERIF data model can be found in the CERIF 2008–1.2 Full Data Model – Introduction and Specification document [1]. For the CERIF Semantics we refer to the CERIF 2008–1.2 Semantics document [2]. Some XML examples are provided in the appendix and validated CERIF example xml files are available at the euroCRIS website for members.

4. CERIF XML Validation

For validating the CERIF 2008–1.2 XML files, XML Schema files are provided. XML Schema is a format supported by W3C [3]. The validation of XML files with XML Schema ensures data quality and consistency across datasets and allows for error detection. Any import of CERIF XML data should be avoided if no validation of the XML files has been undertaken to prevent from erroneous data in the system.

To validate the CERIF XML files, XML Schema references have to be added to the CERIF root element, as explained in the previous section.

```
<CERIF
  xsi:schemaLocation="http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/XML-SCHEMAS/
                      cfEntityName-EntityType http://www.eurocris.org/Uploads/
                      http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/XML-SCHEMAS/
                      cfEntityName-EntityType.xsd"
  xmlns="http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/XML-SCHEMAS/cfEntityName-EntityType"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
>
```

We strongly recommend the creation of single entity and source database centered XML files also for reasons of validation.

With the CERIF XML Schemas, the CERIF XML-based data will be validated against data type, structure and mandatory elements. The semantics of the data will not be validated and is in the responsibility of data suppliers.

The XML Schema files for validation are available from the euroCRIS website for download and for reference.

5. XML Import Process

In order to achieve quality and consistency with data, the following steps are recommended while importing CERIF XML data.

1 **Data Validation:** Only validated CERIF XML files should be imported.

2 **Data Separation:** XML files should be separated by source database **and** by entity type as recommended in chapter 2 - XML File Production.

3 **Assigning Source Database:** If XML data from multiple data sources will be imported into one physical database, then, the originating source database has to be identified. A collection from multiple source databases and their identifiers can be managed from within the Semantic Layer [1].

For data import from heterogeneous sources we recommend the following:

-> Definition of a source databases in the cfClassification table (cfClassId)
-> Connection of this source databases with a Classification Scheme (cfClassSchemeId)
-> With source database definition at the Semantic Layer the import process can start
-> During the import process all Base, Result, 2nd Level database entries should get a reference entry to the source database within their Entity_Class link tables (cfPers_Class, cfProj_Class, cfOrgUnit_Class, cfEvent_Class…)

The collection of source databases, their description and extension is maintained and pre-defined within the Semantic Layer by Classification entities [1]. For the data import we recommend a particular import order (see 4), which requires Classification data to be imported (or defined) first, as during imports, the references to the link tables (cfClassId, cfClassSchemeId) have to be set.

An identifier (URI) for the source database definition within the Semantic Layer may be extracted from the *sourceDatabase* attribute within the CERIF XML root elements.

4 **Referential Integrity:** To maintain referential integrity during the import process, the sequence of entities should be determined:

(1) Import of Classification Entities (CLASS)
(2) Import of 2nd Level Entities (2ND)
(3) Import of Base Entities (BASE)
(4) Import of Result Entities (RES)
(5) Import of Link Entities (LINK)
(6) Import of Language-dependent Entities (LANG)
(7) Import of Additional Entities (ADD)

If only a single XML file with no separation of entity types is provided. The order of the XML entities inside the XML file should correspond to the above order, to guarantee referential integrity within the single XML file and later the importing system.

A storage and thus validation of one single XML file is not supported by the current CERIF XML Schema files and due to size and complexity may become a serious problem. **Therefore, we do strongly recommend the separation of data according to the presented entity types.**

5 Error Handling: No partial import should be allowed to ensure the integrity of data.

Each of the steps is dependent on the previous one. If any step could not be successfully completed, then the next step should not be started. A particular import order in between the CERIF XML file types themselves is not foreseen. That is, no order in between CERIF Base typed XML files or in between CERIF Result typed XML files.

Requirements and System Constraints:

- Availability of a universal data import format at the system, capable to accommodate different subsets of a data model from different data suppliers.
- Availability of an export format from the running systems of data suppliers.
- Mapping definition of system entities to CERIF entities.
- Unicode support in systems of data suppliers.

6. Non-CERIF Extensions

Data providers may also add non-CERIF attributes and entities to XML files. Such additions:

(1) could be mapped to CERIF entities if there is substantial overlap
(2) could be ignored by the import process if there is only little overlap

An example for attribute extension at the link entity Project_Funding and its corresponding XML link entity <cfProj_Fund> representation is given below:

Example Attributes for Extension at Link Entity Project_Funding (cfProj_Fund)

RC = Running Costs (default=0, contractdata) in euro
PC = Personnel Costs (default=0, contractdata) in euro
OH = Overhead (default=0, contractdata) in euro
EC = Equipment Costs (default=0, contractdata) in euro
RCS = Running Costs spent (default=0, spending) in euro
PCS = Personnel Costs spent (default=0, spending) in euro
OHS = Overhead spent(default=0, spending) in euro
ECS = Equipment Costs spent (default=0, spending) in euro

```
<!-- XML Link Entity Project_Funding extensions -->

<cfProj_Fund>
   <cfProjId>ID</cfProjId>
   <cfFundId>ID</cfFundId>
   <cfClassSchemeId>CLASSIFICATIONSCHEMEID</cfClassSchemeId>
   <cfCLASSId>CLASSIFICATIONID</cfCLASSId>
   <cfFraction>Float</cfFraction>
   <cfAmount cfCurrencyCode="EUR">Float</cfAmount>
<!-- CERIF Extension -->
   <cfRC cfCurrencyCode="EUR">Float</cfRC>
   <cfPC cfCurrencyCode="EUR">Float</cfPC>
   <cfOH cfCurrencyCode="EUR">Float</cfOH>
   <cfEC cfCurrencyCode="EUR">Float</cfEC>
   <cfRCS cfCurrencyCode="EUR">Float</cfRCS>
   <cfPCS cfCurrencyCode="EUR">Float</cfPCS>
   <cfOHS cfCurrencyCode="EUR">Float</cfOHS>
   <cfECS cfCurrencyCode="EUR">Float</cfECS>
<!-- End of CERIF Extension -->
   <cfStartDate>Timestamp</cfStartDate>
   <cfEndDate>Timestamp</cfEndDate>
</cfProj_Fund>
```

The extension of CERIF with introduced attributes (see above) allows i.e. for a yearly budgetting and for the calculation of spendings per project.

Data providers should contact the CERIF task group and the Best Practice task group for needed extensions. Proposals can be submitted to the CERIF task group, where the suggestions will then be discussed and a decision towards extension will be taken and the CERIF model accordingly adapte, if of general interest for the Research Information Domain.

7. Future Work

More work on namespaces is being considered for future CERIF XML specifications. The introduction of CERIF ontologies may support the integration process of CERIF XML files.

8. Appendix

8.1 CERIF XML Examples

8.1.1 CERIF BASE XML Entities (XML Examples)

```
<?xml version="1.0" encoding="UTF-8"?>
<CERIF
  xsi:schemaLocation="http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/
                      XML-SCHEMAS/cfPers-BASE
                      http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/
                      XML-SCHEMAS/cfPers-BASE.xsd"
  xmlns=" http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/XML-SCHEMAS/cfPers-BASE"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  release="2008-1.2" date="2010-11-22" sourceDatabase="euroCRIS">
        <cfPers>
          <cfPersId>person-keith-jeffery</cfPersId>
          <cfBirtdate>XXXX</Birthdate>
          <cfGender>m</cfGender>
        </cfPers>
        <cfPers>
          <cfPersId>person-anne-asserson</cfPersId>
          <cfBirtdate>XXXX</Birthdate>
          <cfGender>f</cfGender>
        </cfPers>
        <cfPers>
          <cfPersId>person-brigitte-joerg</cfPersId>
          <cfBirtdate>XXXX</Birthdate>
          <cfGender>f</cfGender>
          <cfURI>http://www.dfki.de/~brigitte/</cfURI>
        </cfPers>
        <cfPers>
          <cfPersId>person-geert-van-grootel</cfPersId>
          <cfBirtdate>XXXX</Birthdate>
          <cfGender>m</cfGender>
        </cfPers>
          ...
</CERIF>

<?xml version="1.0" encoding="UTF-8"?>
<CERIF
  xsi:schemaLocation=" http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/
                      XML-SCHEMAS/cfProj-BASE
                      http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/
                      XML-SCHEMAS/cfProj-BASE.xsd"
  xmlns=" http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/XML-SCHEMAS/cfProj-BASE"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  release="2008-1.2" date="2010-11-22" sourceDatabase="euroCRIS">
        <cfProj>
          <cfProjId>project-ist-world</cfProjId>
          <cfURI>http://www.ist-world.org/</cfURI>
          <cfAcronym>IST World</cfAcronym>
          <cfStartDate>2005-04-01</cfStartDate>
          <cfEndDate>2007-09-30</cfEndDate>
        </cfProj>
        <cfProj>
          <cfProjId>project-lt-world</cfProjId>
          <cfURI>http://www.lt-world.org/</cfURI>
```

```
            <cfAcronym>LT World</cfAcronym>
            <cfStartDate>2001-04-01</cfStartDate>
            <cfEndDate>2006-12-31</cfEndDate>
        </cfProj>
        <cfProj>
          ...
</CERIF>

<?xml version="1.0" encoding="UTF-8"?>
<CERIF
  xsi:schemaLocation="http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/
                      XML-SCHEMAS/cfOrgUnit-BASE
                      http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/
                      XML-SCHEMAS/cfOrgUnit-BASE.xsd"
  xmlns=" http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/XML-SCHEMAS/cfOrgUnit-BASE"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  release="2008-1.2" date="2010-11-02" sourceDatabase="euroCRIS">
        <cfOrgUnit>
            <cfOrgUnitId>orgunit-dfki</cfOrgUnitId>
            <cfURI>http://www.dfki.de/</cfURI>
            <cfAcronym>DFKI</cfAcronym>
        </cfOrgUnit>
        <cfOrgUnit>
            <cfOrgUnitId>orgunit-lt-lab</cfOrgUnitId>
            <cfURI>http://www.dfki.de/lt/</cfURI>
            <cfAcronym>LT Lab</cfAcronym>
            <cfHeadCount>50</cfHeadCount>
        </cfOrgUnit>
            ...
</CERIF>
```

8.1.2 CERIF Result XML Entities (XML Examples)

```
<?xml version="1.0" encoding="UTF-8"?>
<CERIF
  xsi:schemaLocation="http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/
                      XML-SCHEMAS/cfResPubl-RES
                      http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/
                      XML-SCHEMAS/cfResPubl-RES.xsd"
  xmlns=" http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/XML-SCHEMAS/cfResPubl-RES"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  release="2008-1.2" date="2010-11-02" sourceDatabase="euroCRIS">
        <cfResPubl>
            <cfResPublId>publication-joerg-et-al</cfResPublId>
            <cfURI>http://www.eurocris.org/fileadmin/Upload/Events/
                Conferences/CRIS2008/Papers/cris2008_Joerg.pdf </cfURI>
            <cfResPublDate>2008</cfResPublDate>
            <cfStartPage>107</cfStartPage>
            <cfEndPage>123</cfEndPage>
            <cfISBN>978-961-6133-38-8</cfISBN>
        </cfResPubl>
        <cfResPubl>
            <cfResPublId>publication-veda-c-storey</cfResPublId>
            <cfURI>http://www.springerlink.com/content/j23263j02m850617/</cfURI>
            <cfResPublDate>1993</cfResPublDate>
            <cfNum>4</cfNum>
```

```
            <cfVol>2</cfVol>
            <cfStartPage>455</cfStartPage>
            <cfEndPage>488</cfEndPage>
            <cfISSN>1066-8888</cfISSN>
        </cfResPubl>
          ...
</CERIF>
```

8.1.3 CERIF 2nd Level XML Entities (XML Examples)

```
<?xml version="1.0" encoding="UTF-8"?>
<CERIF
  xsi:schemaLocation="http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/
                      XML-SCHEMAS/cfEAddr-2ND
                      http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/
                      XML-SCHEMAS/cfEAddr-2ND.xsd"
  xmlns=" http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/XML-SCHEMAS/cfEADDR-2ND"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  release="2008-1.2" date="2010-11-02" sourceDatabase="euroCRIS">
        <cfEAddr>
          <cfEAddrId>eaddress-skype.joerg</cfEAddrId>
          <cfPAddrId>paddress-bj</cfPAddrId>
          <cfURI>brigitte.joerg</cfURI>
        </cfEAddr>
        <cfEAddr>
          <cfEAddrId>eaddress-email-joerg</cfEAddrId>
          <cfPAddrId>paddress-bj</cfPAddrId>
          <cfURI>brigitte.joerg@dfki.de</cfURI>
        </cfEAddr>
</CERIF>

<?xml version="1.0" encoding="UTF-8"?>
<CERIF
  xsi:schemaLocation="http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/
                      XML-SCHEMAS/cfPAddr-2ND
                      http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/
                      XML-SCHEMAS/cfPAddr-2ND.xsd"
  xmlns=" http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/XML-SCHEMAS/cfPAddr-2ND"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  release="2008-1.2" date="2010-11-02" sourceDatabase="euroCRIS">
        <cfPAddr>
          <cfPAddrId>paddress-dfki</cfPAddrId>
          <cfAddrline1>Stuhlsatzenhausweg 3</cfPAddrline1>
          <cfAddrline2>Postfach</cfAddrline2>
          <cfCityTown>Saarbrücken</cfCityTown>
          <cfPostCode>66123</cfPostCode>
          <cfCountryCode>DE</cfCountryCode>
        </cfPAddr>
          ...
</CERIF>

<?xml version="1.0" encoding="UTF-8"?>
<CERIF
  xsi:schemaLocation="http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/
                      XML-SCHEMAS/cfEquip-2ND
                      http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/
```

```
                        XML-SCHEMAS/cfEquip-2ND.xsd"
  xmlns=" http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/XML-SCHEMAS/cfEquip-2ND"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  release="2008-1.2" date="2010-11-02" sourceDatabase="euroCRIS">
          <cfEquip>
             <cfEquipId>equip-smart</cfEquipId>
             <cfOEMId>013212300</cfOEMId>
             <cfEquipOwnId>0142123</cfEquipOwnId>
          </cfEquip>
          <cfEquip>
             <cfEquipId>equip-sony-smart</cfEquipId>
             <cfOEMId>013212301</cfOEMId>
             <cfEquipOwnId>0142123</cfEquipOwnId>
          </cfEquip>
            ...
</CERIF>

<?xml version="1.0" encoding="UTF-8"?>
<CERIF
  xsi:schemaLocation="http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/
                        XML-SCHEMAS/cfEvent-2ND
                        http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/
                        XML-SCHEMAS/cfEvent-2ND.xsd"
  xmlns=" http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/XML-SCHEMAS/cfEvent-2ND"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  release="2008-1.2" date="2010-11-02" sourceDatabase="euroCRIS">
          <cfEvent>
             <cfEventId>event-cris06</cfEventId>
             <cfLocation>Bergen</cfLocation>
             <cfFeeOrFree>Fee</cfFeeOrFree>
            <cfStartDate>2006-05-11</cfStartDate>
            <cfEndDate>2006-05-13</cfEndDate>
             <cfURI>http://www.eurocris.org/CRIS2006/</cfURI>
          </cfEvent>
          <cfEVENT>
             <cfEventId>event-cris08</cfEventId>
             <cfLocation>Maribor</cfLocation>
             <cfFeeOrFree>Fee</cfFeeOrFree>
            <cfStartDate>2008-05-11</cfStartDate>
            <cfEndDate>2008-05-13</cfEndDate>
             <cfURI>http://www.eurocris.org/CRIS2008/</cfURI>
          </cfEvent>
</CERIF>
```

8.1.4 CERIF Multiple Language Entities (XML Examples)

```
<?xml version="1.0" encoding="UTF-8"?>
<CERIF
  xsi:schemaLocation="http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/
                        XML-SCHEMAS/cfClassDescr-LANG
                        http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/
                        XML-SCHEMAS/cfClassDescr-LANG.xsd"
  xmlns=" http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/XML-SCHEMAS/cfClassDescr-LANG"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  release="2008-1.2" date="2010-11-02" sourceDatabase="euroCRIS">
```

```
        <cfClassDescr>
          <cfClassId>class-manager</cfClassId>
          <cfClassSchemeId>class-scheme-org-structure</cfClassSchemeId>
          <cfDescr cfLangCode="EN" cfTrans="o">A manager is a person that …</cfDescr>
        </cfClassDescr>
        <cfClassDescr>
          <cfClassId>class-manager</cfClassId>
          <cfClassSchemeId>class-scheme-org-structure</cfClassSchemeId>
          <cfDescr cfLangCode="DE" cfTrans="h">Ein Manager ist eine Person, die …</cfDescr>
        </cfClassDescr>
        <cfClassDescr>
          <cfClassId>class-ceo</cfClassId>
          <cfClassSchemeId>class-scheme-org-structure</cfClassSchemeId>
          <cfDescr cfLangCode="EN" cfTrans="o">A CEO is a person that …</cfDescr>
        </cfClassDescr>
        <cfClassDescr>
          <cfClassId>class-ceo</cfClassId>
          <cfClassSchemeId>class-scheme-org-structure</cfClassSchemeId>
          <cfDescr cfLangCode="DE" cfTrans="h">Ein CEO ist eine Person, die …</cfDescr>
        </cfClassDescr>
          …
</CERIF>

<?xml version="1.0" encoding="UTF-8"?>
<CERIF
  xsi:schemaLocation="http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/
                      XML-SCHEMAS/cfClassSchemeDescr-LANG
                      http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/
                      XML-SCHEMAS/cfClassSchemeDescr-LANG.xsd"
  xmlns="http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/XML-SCHEMAS/
         cfClassSchemeDescr-LANG"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  release="2008-1.2" date="2010-11-02" sourceDatabase="euroCRIS">
        <cfClassSchemeDescr>
          <cfClassSchemeId>class-scheme-org-structure</cfClassSchemeId>
          <cfDescr cfLangCode="DE" cfTrans="o">Das Schema "Organisations-Struktur"  ermöglicht die
                      Strukturierung von Aufgaben- und Stellen …</cfDescr>
        </cfClassSchemeDescr>
        <cfClassSchemeDescr>
          <cfClassSchemeId>class-scheme-org-structure</cfClassSchemeId>
          <cfDescr cfLangCode="EN" cfTrans="h">The scheme "Organisations-Struktur" allows for the
                      structuring of tasks and entities …</cfDescr>
        </cfClassSchemeDescr>
          …
</CERIF>

<?xml version="1.0" encoding="UTF-8"?>
<CERIF
  xsi:schemaLocation="http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/
                      XML-SCHEMAS/cfClassTerm-LANG
                      http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/
                      XML-SCHEMAS/cfClassTerm-LANG.xsd"
  xmlns=" http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/XML-SCHEMAS/cfClassTerm-LANG"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  release="2008-1.2" date="2010-11-02" sourceDatabase="euroCRIS">
        <cfClassTerm>
          <cfClassId>class-manager</cfClassId>
```

```
            <cfClassSchemeId>class-scheme-org-structure</cfClassSchemeId>
            <cfTerm cfLangCode="EN" cfTrans="o">Manager</cfTerm>
        </cfClassTerm>
        <cfClassTerm>
            <cfClassId>class-ceo</cfClassId>
            <cfClassSchemeId>class-scheme-org-structure</cfClassSchemeId>
            <cfTerm cfLangCode="EN" cfTrans="o">Chief Executive Officer</cfTerm>
        </cfClassTerm>
          ...
</CERIF>

<?xml version="1.0" encoding="UTF-8"?>
<CERIF
  xsi:schemaLocation="http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/
                      XML-SCHEMAS/cfEventName-LANG
                      http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/
                      XML-SCHEMAS/cfEventName-LANG.xsd"
  xmlns=" http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/XML-SCHEMAS/cfEventName-LANG"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  release="2008-1.2" date="2010-11-02" sourceDatabase="euroCRIS">
        <cfEventName>
            <cfEventId>event-cris06</cfEventId>
            <cfName cfLangCode="EN" cfTrans="o">8th international Conference on Current Research Information
        Systems</cfName>
        </cfEventName>
        <cfEventName>
            <cfEventId>event-cris08</cfEventId>
            <cfName cfLangCode="EN" cfTrans="o">9th international Conference on Current Research Information
        Systems</cfName>
        </cfEventName>
</CERIF>
```

8.1.5 CERIF Link Entities (XML Examples)

```
<?xml version="1.0" encoding="UTF-8"?>
<CERIF
  xsi:schemaLocation="http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/
                      XML-SCHEMAS/cfResPubl_Class-LINK
                      http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/
                      XML-SCHEMAS/cfResPubl_Class-LINK.xsd"
  xmlns=" http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/XML-SCHEMAS/cfResPubl_Class-LINK"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  release="2008-1.2" date="2010-11-02" sourceDatabase="euroCRIS">
        <cfResPubl_Class>
            <cfResPublId>publication-joerg-et-al</cfResPublId>
            <cfClassId>class-conf-proceedings-article</cfClassId>
            <cfClassSchemeId>class-scheme-cerif-publication-types</cfClassSchemeId>
            <cfFraction>1.00</cfFraction>
            <cfStartDate>2008-10-01T00:00:00-00:00</cfStartDate>
            <cfEndDate>2099-12-31T00:00:00-00:00</cfEndDate>
        </cfResPubl_Class>
        <cfResPubl_Class>
            <cfResPublId>publication-storey-c-veda</cfResPublId>
            <cfClassId>class-journal-article</cfClassId>
            <cfClassSchemeId>class-scheme-cerif-publication-types</cfClassSchemeId>
            <cfFraction>1.00</cfFraction>
```

```
            <cfStartDate>2008-10-01T00:00:00-00:00</cfStartDate>
            <cfEndDate>2099-12-31T00:00:00-00:00</cfEndDate>
        </cfResPubl_Class>
            ...
</CERIF>

<?xml version="1.0" encoding="UTF-8"?>
<CERIF
  xsi:schemaLocation="http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/
                      XML-SCHEMAS/cfPers_OrgUnit-LINK
                      http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/
                      XML-SCHEMAS/cfPers_OrgUnit-LINK.xsd"
  xmlns=" http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/XML-SCHEMAS/cfPers_OrgUnit-LINK"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  release="2008-1.2" date="2010-11-02" sourceDatabase="euroCRIS">
        <cfPers_OrgUnit>
            <cfPersId>person-brigitte-joerg</cfPersId>
            <cfOrgUnitId>orgunit-dfki</cfOrgUnitId>
            <cfClassId>class-is-affiliated-with</cfClassId>
            <cfClassSchemeId>class-scheme-pers-orgunit-roles</cfClassSchemeId>
            <cfFraction>1.00</cfFraction>
            <cfStartDate>2004-04-01T00:00:00-00:00</cfStartDate>
            <cfEndDate>2099-12-31T00:00:00-00:00</cfEndDate>
        </cfPers_OrgUnit>
        <cfPers_OrgUnit>
            <cfPersId>person-brigitte-joerg</cfPersId>
            <cfOrgUnitId>orgunit-lt-lab</cfOrgUnitId>
            <cfClassId>class-is-subaffiliated-with</cfClassId>
            <cfClassSchemeId>class-scheme-pers-orgunit-roles</cfClassSchemeId>
            <cfFraction>1.00</cfFraction>
            <cfStartDate>2004-04-01T00:00:00-00:00</cfStartDate>
            <cfEndDate>2099-12-31T00:00:00-00:00</cfEndDate>
        </cfPers_OrgUnit>
            ...
</CERIF>
```

8.1.6 CERIF Classification Entities (XML Examples)

```
<?xml version="1.0" encoding="UTF-8"?>
<CERIF
  xsi:schemaLocation="http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/
                      XML-SCHEMAS/cfClass-CLASS
                      http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/
                      XML-SCHEMAS/cfClass-CLASS.xsd"
  xmlns=" http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/XML-SCHEMAS/cfClass-CLASS"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  release="2008-1.2" date="2010-11-02" sourceDatabase="euroCRIS">
        <cfClass>
            <cfClassId>class-manager</cfClassId>
            <cfClassSchemeId>class-scheme-org-structure</cfClassSchemeId>
            <cfStartDate>1990-01-01T00:00:00-00:00</cfStartDate>
            <cfEndDate>2099-12-31T00:00:00-00:00</cfEndDate>
        </cfClass>
        <cfClass>
            <cfClassId>class-conf-proceedings-article</cfClassId>
```

```
            <cfClassSchemeId>class-scheme-cerif-publication-types</cfClassSchemeId>
            <cfStartDate>2009-01-19T00:00:00-00:00</cfStartDate>
            <cfEndDate>2099-12-31T00:00:00-00:00</cfEndDate>
          </cfClass>
          <cfClass>
            <cfClassId>class-journal-article</cfClassId>
            <cfClassSchemeId>class-scheme-cerif-publication-types</cfClassSchemeId>
            <cfStartDate>2009-01-19T00:00:00-00:00</cfStartDate>
            <cfEndDate>2099-12-31T00:00:00-00:00</cfEndDate>
          </cfClass>
            ...
</CERIF>

<?xml version="1.0" encoding="UTF-8"?>
<CERIF
  xsi:schemaLocation="http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/
                      XML-SCHEMAS/cfClassScheme-CLASS
                      http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/
                      XML-SCHEMAS/cfClassScheme-CLASS.xsd"
  xmlns=" http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/XML-SCHEMAS/cfClassScheme-CLASS"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  release="2008-1.2" date="2010-11-02" sourceDatabase="euroCRIS">
          <cfClassScheme>
            <cfClassSchemeId>class-scheme-cerif-publication-types</cfClassSchemeId>
            <cfURI>http://www.eurocris.org/fileadmin/cerif-2008/CERIF2008_1.0_Semantics.pdf</cfURI>
          </cfClassScheme>
          <cfClassScheme>
            <cfClassSchemeId>class-scheme-org-structure</cfClassSchemeId>
          </cfClassScheme>
            ...
</CERIF>
```

8.2 CERIF XML Schema Examples

CERIF XML schemas are provided for the validation of CERIF XML files. They are available for download from the euroCRIS website[3]. A validation of CERIF XML files is realised by referring to validating CERIF XML Schema files from within CERIF XML files, as explained within section 3. The CERIF XML schemas are built according to the XML Schema specification as recommended by the W3C [4]. The targetNamespace attribute in the following XML Schema example indicates to which CERIF XML entity (i.e. cfClass_Class-LINK) the schema belongs. The following example schema belongs to the CERIF Link entity cfClass_Class and thus, validates cfClass_Class-LINK.xml files.

```
<?xml version="1.0" encoding="UTF-8"?>
<xs:schema targetNamespace="http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/XML-SCHEMAS/cfClass_Class-LINK"
            xmlns:xs="http://www.w3.org/2001/XMLSchema"
            xmlns=" http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/XML_SCHEMAS/cfClass_Class-LINK">
    <xs:element name="CERIF">
        <xs:complexType>
            <xs:sequence>
                <xs:element ref="cfClass_Class"/>
            </xs:sequence>
            <xs:attribute name="release" type="xs:string" use="required"/>
            <xs:attribute name="date" type="xs:date" use="required"/>
            <xs:attribute name="sourceDatabase" type="xs:string" use="required"/>
        </xs:complexType>
    </xs:element>
    <xs:element name="cfClass_Class">
        <xs:complexType>
            <xs:sequence>
                <xs:element ref="cfClassId1"/>
                <xs:element ref="cfClassId2"/>
                <xs:element ref="cfClassSchemeId1"/>
                <xs:element ref="cfClassSchemeId2"/>
                <xs:element ref="cfClassId"/>
                <xs:element ref="cfClassSchemeId"/>
                <xs:element ref="cfStartDate"/>
                <xs:element ref="cfEndDate"/>
                <xs:element ref="cfFraction" minOccurs="0"/>
            </xs:sequence>
        </xs:complexType>
    </xs:element>
    <xs:element name="cfClassId1" type="cfClassId1Type"/>
    <xs:element name="cfClassId2" type="cfClassId2Type"/>
    <xs:element name="cfClassSchemeId1" type="cfClassSchemeId1Type"/>
    <xs:element name="cfClassSchemeId2" type="cfClassSchemeId2Type"/>
    <xs:element name="cfClassId" type="cfClassIdType"/>
    <xs:element name="cfClassSchemeId" type="cfClassSchemeIdType"/>
    <xs:element name="cfStartDate" type="xs:dateTime"/>
    <xs:element name="cfEndDate" type="xs:dateTime"/>
    <xs:element name="cfFraction" type="xs:float"/>
    <xs:simpleType name="cfClassId1Type">
        <xs:restriction base="xs:string">
            <xs:maxLength value="128"/>
        </xs:restriction>
    </xs:simpleType>
    <xs:simpleType name="cfClassId2Type">
        <xs:restriction base="xs:string">
            <xs:maxLength value="128"/>
        </xs:restriction>
    </xs:simpleType>
    <xs:simpleType name="cfClassSchemeId1Type">
        <xs:restriction base="xs:string">
            <xs:maxLength value="128"/>
        </xs:restriction>
    </xs:simpleType>
    <xs:simpleType name="cfClassSchemeId2Type">
        <xs:restriction base="xs:string">
            <xs:maxLength value="128"/>
        </xs:restriction>
    </xs:simpleType>
    <xs:simpleType name="cfClassIdType">
        <xs:restriction base="xs:string">
            <xs:maxLength value="128"/>
        </xs:restriction>
    </xs:simpleType>
    <xs:simpleType name="cfClassSchemeIdType">
        <xs:restriction base="xs:string">
            <xs:maxLength value="128"/>
        </xs:restriction>
    </xs:simpleType>
</xs:schema>
```

[3] CERIF 2008-1.2 XML Schema Files:
http://www.eurocris.org/Uploads/Web%20pages/CERIF2008/Release_1.2/XML-SCHEMAS/

8.3 List of CERIF Entities

Following is a full list of the CERIF entities in alphabetic order, grouped by entity type, giving the Logical and Physical Name of entities in parentheses.

8.3.1 CERIF Base Entities (Logical (PhysicalName))

cfProject (cfProj)
cfPerson (cfPers)
cfOrgUnit (cfOrgUnit)

8.3.2 CERIF Result Entities (Logical (PhysicalName))

cfResultPublication (cfResPubl)
cfResultPatent (cfResPat)
cfResultProduct (cfResProd)

8.3.3 CERIF 2nd Level Entities (Logical (PhysicalName))

cfCitation (cfCite)
cfCountry (cfCountry)
cfCurrency (cfCurrency)
cfCurriculumVitae (cfCV)
cfElectronicAddress (cfEAddr)
cfEquipment (cfEquip)
cfEvent (cfEvent)
cfExpertiseAndSkills (cfExpSkills)
cfFacility (cfFacil)
cfFunding (cfFund)
cfLanguage (cfLanguage)
cfMetrics (cfMetrics)
cfPostalAddress (cfPAddr)
cfPrizeAward (cfPrize)
cfQualification (cfQqual)
cfService (cfSrv)

8.3.4 CERIF Link Entities (Logical (PhysicalName))

cfCitation_Classification (cfCite_Class)
cfClassification_Classification (cfClass_Class)
cfClassScheme_ClassScheme (cfClassScheme_ClassScheme)
cfCountry_Classification (cfCountry_Class)
cfCurrency_Classification (cfCurrency_Class)
cfCV_Classification (cfCV_Class)
cfElectronicAddress_Classification (cfEAddr_Class)
cfEquipment_Classification (cfEquip_Class)
cfEquipment_Funding (cfEquip_Fund)
cfEvent_Event
cfEvent_Classification (cfEvent_Class)
cfEvent_Funding (cfEvent_Fund)
cfEvent_ResultPublication (cfEvent_ResPubl)
cfExpertiseAndSkills_Classification (cfExpSkills_Class)
cfFacility_Classification (cfFacil_Class)
cfFacility_Funding (cfFacil_Fund)
cfFunding_Classification (cfFund_Class)
cfFunding_Funding (cfFund_Fund)

cfLanguage_Classification (cfLanguage_Class)
cfMetrics_Classification (cfMetrics_Class)
cfOrganisationUnit_Classification (cfOrgUnit_Class)
cfOrganisationUnit_DublinCore (cfOrgUnit_DC)
cfOrganisationUnit_ElectronicAddress (cfOrgUnit_EAddr)
cfOrganisationUnit_Equipment (cfOrgUnit_Equip)
cfOrganisationUnit_Event (cfOrgUnit_Event)
cfOrganisationUnit_ExpertiseAndSkills (cfOrgUnit_ExpSkills)
cfOrganisationUnit_Facility (cfOrgUnit_Facil)
cfOrganisaitonUnit_Funding (cfOrgUnit_Fund)
cfOrganisationUnit_OrgUnit (cfOrgUnit_OrgUnit)
cfOrganisationUnit_PostalAddress (cfOrgUnit_PAddr)
cfOrganisationUnit_PrizeAward (cfOrgUnit_Prize)
cfOrganisationUnit_ResultPatent (cfOrgUnit_ResPat)
cfOrganisationUnit_ResultProduct (cfOrgUnit_ResProd)
cfOrganisationUnit_ResultPublication (cfOrgUnit_ResPubl)
cfOrganisationUnit_Service (cfOrgUnit_Srv)
cfPerson_Classification (cfPers_Class)
cfPerson_CV (cfPers_CV)
cfPerson_DublinCore (cfPers_DC)
cfPerson_ElectronicAddress (cfPers_EAddr)
cfPerson_Equipment (cfPers_Equip)
cfPerson_Event (cfPers_Event)
cfPerson_ExpertiseAndSkills (cfPers_ExpSkills)
cfPerson_Facility (cfPers_Facil)
cfPerson_Funding (cfPers_Fund)
cfPerson_Language (cfPers_Lang)
cfPerson_Country (cfPers_Country)
cfPerson_OrganisationUnit (cfPers_OrgUnit)
cfPerson_Person (cfPers_Pers)
cfPerson_PostAddress (cfPers_PAddr)
cfPerson_PrizeAward (cfPers_Prize)
cfPerson_Qualification (cfPers_Qual)
cfPerson_ResultPatent (cfPers_ResPat)
cfPerson_ResultProduct (cfPers_ResProd)
cfPerson_ResultPublication (cfPers_ResPubl)
cfPerson_Service (cfPers_Srv)
cfPersonName_Person (cfPersName_Pers)
cfPostAddress_Classification (cfPAddr_Class)
cfProject_Classification (cfProj_Class)
cfProject_DublinCore (cfProj_DC)
cfProject_Equipment (cfProj_Equip)
cfProject_Event (cfProj_Event)
cfProject_Facility (cfProj_Facil)
cfProject_Funding (cfProj_Fund)
cfProject_OrganisationUnit (cfProj_Orgunit)
cfProject_Person (cfProj_Pers)
cfProject_PrizeAward (cfProj_Prize)
cfProject_Project (cfProj_Proj)
cfProject_Service (cfProj_Srv)
cfProject_ResultPatent (cfProj_ResPat)
cfProject_ResultProduct (cfProj_ResProd)
cfProject_ResultPublication (cfProj_ResPubl)
cfResultPatent_Classification (cfResPat_Class)
cfResultPatent_Funding (cfResPat_Fund)
cfResultPatent_ResultPatent
cfResultProduct_Classification (cfResProd_Class)

cfResultProduct_Funding (cfResProd_Fund)
cfResultProduct_ResultProduct
cfResultPublication_Citation (cfResPubl_Cite)
cfResultPublication_Classification (cfResPubl_Class)
cfResultPublication_DublinCore (cfResPubl_DC)
cfResultPublication_Event (cfResPubl_Event)
cfResultPublication_Equipment (cfResPubl_Equip)
cfResultPublication_Facility (cfResPubl_Facil)
cfResultPublication_Funding (cfResPubl_Fund)
cfResultPublication_Metrics (cfResPubl_Metrics)
cfResultPublication_ResultPatent (cfResPubl_ResPat)
cfResultPublication_ResultProduct (cfResPubl_ResProd)
cfResultPublication_ResultPublication (cfResPubl_ResPubl)
cfService_Classification (cfSrv_Class)
cfService_Funding (cfSrv_Fund)

8.3.5 CERIF Multiple Language Features (Logical (PhysicalName))

cfCitationDescription (cfCiteDescr)
cfCitationTitle (cfCiteTitle)
cfClassificationDescription (cfClassDescr)
cfClassificationTerm (cfClassTerm)
cfClassificationSchemeDescription (cfClassSchemeDescr)
cfCountryName (cfCountryName)
cfCurrencyEntityName (cfCurrencyEntityName)
cfCurrencyName (cfCurrencyName)
cfEquipmentDescription (cfEquipPDescr)
cfEquipmentKeywords (cfEquipKeyw)
cfEquipmentName (cfEquipName)
cfEventDescription (cfEventDescr)
cfEventKeywords (cfEventKeyw)
cfEventName (cfEventName)
cfExpertiseAndSkillsDescription (cfExpSkillsDescr)
cfExpertiseAndSkillsKeywords (cfExpSillsKeyw)
cfExpertiseAndSkillsName (cfExpSkillsName)
cfFacilityDescription (cfFacilDescr)
cfFacilityKeywords (cfFacilKeyw)
cfFacilityName (cfFacilName)
cfFundingDescription (cfFundDescr)
cfFundingKeywords (cfFundKeyw)
cfFundingName (cfFundName)
cfLanguageName (cfLanguageName)
cfMetricsDescription (cfMetricsDescr)
cfMetricsName (cfMetricsName)
cfOrganisationUnitKeywords (cfOrgUnitKeyw)
cfOrganisationUnitName (cfOrgUnitName)
cfOrganisationUnitResearchActivity (cfOrgUnitResAct)
cfPersonResearchInterest (cfPersResInt)
cfPersonKeywords (cfPersKeyw)
cfProjectAbstract (cfProjAbstr)
cfProjectKeywords (cfProjKeyw)
cfProjectTitle (cfProjTitle)
cfResultPatentAbstract (cfResPatAbstr)
cfResultPatentKeywords (cfResPatKeyw)
cfResultPatentTitle (cfResPatTitle)
cfResultProductDescription (cfResProdDescr)
cfResultProductKeywords (cfResProdKeyw)

cfResultProductName (cfResProdName)
cfResultPublicationAbstract (cfResPublAbst)
cfResultPublicationBibliographicNote (cfResPublBiblNote)
cfResultPublicationKeywords (cfResPublKeyw)
cfResultPublicationNameAbbreviation (cfResPublNameAbbrev)
cfResultPublicationSubtitle (cfResPublSubtitle)
cfResultPublicationTitle (cfResPublTitle)
cfServiceDescription (cfSrvDescr)
cfServiceKeywords (cfSrvKeyw)
cfServiceName (cfSrvName)

8.3.6 Additional Entities (Logical (PhysicalName))

cfPersonName (cfPersName)
cfDublinCore (cfDC)
cfDCAudience (cfDCAudience)
cfDCContributor (cfDCContributor)
cfDCCoverage (cfDCCoverage)
cfDCCoverageSpatial (cfDCCoverageSpatial)
cfDCCoverateTemporal (cfDCCoverageTemporal)
cfDCCreator (cfDCCreator)
cfDCDate (cfDCDate)
cfDCDescription (cfDCDescription)
cfDCFormat (cfDCFormat)
cfDCLanguage (cfDCLanguage)
cfDCProvenance (cfDCProvenance)
cfDCPublisher (cfDCPublisher)
cfDCRelation (cfDCRelation)
cfDCResourceIdentifier (cfDCResourceIdentifier)
cfDCResourceType (cfDCResourceType)
cfDCRightsHolder (cfDCRighsHolder)
cfDCRightsManagement (cfDCRightsMM)
cfDCRightsManagementAccessRights (cfDCRightsMMAccessRight)
cfDCRightsManagementLicense (cfDCRightsMMLicence)
cfDCSource (cfDCSource)
cfDCSubject (cfDCSubject)
cfDCTitle (cfDCTitle)
cfFormalisedDublinCoreRightsManagementPricing (FDCRightsMMPricing)
cfFormalisedDublinCoreRightsManagementPrivacy (FDCRightsMMPrivacy)
cfFormalisedDublinCoreRightsManagementRights (FDCRightsMM)
cfFormalisedDublinCoreRightsManagementSecurity (FDCRightsMMSecurity)

8.3.7 CERIF Classification Entities (Logical (PhysicalName))

cfClassification (cfClass)
cfClassificationScheme (cfClassScheme)

8.3.8 CERIF Attributes

8.3.9 Attribute in all Link Tables

cfFraction (cfFraction)

8.3.9.1 Language-dependent attributes including cflangCode and cfTrans

cfAbstract (cfAbstr)

cfDescription (cfDescr)
cfKeywords (cfKeyw)
cfName (cfName)
cfResearchActivity (cfResAct)
cfResearchInterest (cfResInt)
cfTerm (cfTerm)
cfTitle (cfTitle)

8.3.9.2 Currency-dependent attributes

cfAmount (cfAmount)
cfPrice (cfPrice)
cfTurnover (cfTurn)

8.4 Logical / Physical CERIF Entity Names

The following table 1 gives an overview of all CERIF 2008 – 1.2 entities, their corresponding attributes with logical and physical names (including cf prefixes).

Table 1: List of Entities with Logical (alphabetical order) and Physical Names

Logical CERIF2008 - 1.2 Entities	**Physical CERIF2008-1.2 Entities**
cfCitation	cfCite
cfCitation_Classification	cfCite_Class
cfCitationDescription	cfCiteDescr
cfCitationTitle	cfCiteTitle
cfClassification	cfClass
cfClassification_Classification	cfClass_Class
cfClassificationDescription	cfClassDescr
cfClassificationScheme	cfClassScheme
cfClassificationScheme_ClassificationScheme	cfClassScheme_ClassScheme
cfClassificationSchemeDescription	cfClassSchemeDescr
cfClassificationTerm	cfClassTerm
cfCountry	cfCountry
cfCountry_Classification	cfCountry_Class
cfCountryName	cfCountryName
cfCurrency	cfCurrency
cfCurrency_Classification	cfCurrency_Class
cfCurrencyEntityName	cfCurrencyEntName
cfCurrencyName	cfCurrencyName
cfCurriculumVitae	cfCV
cfCurriculumVitae_Classification	cfCV_Class
cfDublinCore	cfDC
cfDublinCoreAudience	cfDCAudience
cfDublinCoreContributor	cfDCContributor
cfDublinCoreCoverage	cfDCCoverage
cfDublinCoreCoverageSpatial	cfDCCoverageSpatial
cfDublinCoreCoverageTemporal	cfDCCoverageTemporal
cfDublinCoreCreator	cfDCCreator
cfDublinCoreDate	cfDCDate
cfDublinCoreDescription	cfDCDescription
cfDublinCoreFormat	cfDCFormat
cfDublinCoreLanguage	cfDCLanguage
cfDublinCoreProvenance	cfDCProvenance

cfDublinCorePublisher	cfDCPublisher
cfDublinCoreRelation	cfDCRelation
cfDublinCoreResourceIdentifier	cfDCResourceIdentifier
cfDublinCoreResourceType	cfDCResourceType
cfDublinCoreRightsHolder	cfDCRightsHolder
cfDublinCoreRightsManagement	cfDCRightsMM
cfDublinCoreRightsManagementAccessRights	cfDCRightsMMAccessRights
cfDublinCoreRightsManagementLicense	cfDCRightsMMLicense
cfDublinCoreSource	cfDCSource
cfDublinCoreSubject	cfDCSubject
cfDublinCoreTitle	cfDCTitle
cfElectronicAddress	cfEAddr
cfElectronicAddress_Classification	cfEAddr_Class
cfEquipment	cfEquip
cfEquipment_Classification	cfEquip_Class
cfEquipment_Funding	cfEquip_Fund
cfEquipmentDescription	cfEquipDescr
cfEquipmentKeywords	cfEquipKeyw
cfEquipmentName	cfEquipName
cfEvent	cfEvent
cfEvent_Classification	cfEvent_Class
cfEvent_Event	cfEvent_Event
cfEvent_Funding	cfEvent_Fund
cfEvent_ResultPublication	cfEvent_ResPubl
cfEventDescription	cfEventDescr
cfEventKeywords	cfEventKeyw
cfEventName	cfEventName
cfExpertiseAndSkills	cfExpSkills
cfExpertiseAndSkills_Classification	cfExpSkills_Class
cfExpertiseAndSkillsDescription	cfExpSkillsDescr
cfExpertiseAndSkillsKeywords	cfExpSkillsKeyw
cfExpertiseAndSkillsName	cfExpSkillsName
cfFacility	cfFacil
cfFacility_Classification	cfFacil_Class
cfFacility_Funding	cfFacil_Fund
cfFacilityDescription	cfFacilDescr
cfFacilityKewords	cfFacilKeyw
cfFacilityName	cfFacilName
cfFormalisedDublinCoreRightsManagementPricing	cfFDCRightsMMPricing
cfFormalisedDublinCoreRightsManagementPrivacy	cfFDCRightsMMPrivacy
cfFormalisedDublinCoreRightsManagementRights	cfFDCRightsMMRights
cfFormalisedDublinCoreRightsManagementSecurity	cfFDCRightsMMSecurity
cfFunding	cfFund
cfFunding_Classification	cfFund_Class
cfFunding_Funding	cfFund_Fund
cfFundingDescription	cfFundDescr
cfFundingKeywords	cfFundKeyw
cfFundingName	cfFundName
cfLanguage	cfLang
cfLanguage_Classification	cfLang_Class
cfLanguageName	cfLangName
cfMetrics	cfMetrics
cfMetrics_Classification	cfMetrics_Class
cfMetricsDescription	cfMetricsDescr
cfMetricsName	cfMetricsName
cfOrganisationUnit	cfOrgUnit
cfOrganisationUnit_Classification	cfOrgUnit_Class

cfOrganisationUnit_DublinCore	cfOrgUnit_DC
cfOrganisationUnit_ElectronicAddress	cfOrgUnit_EAddr
cfOrganisationUnit_Equipment	cfOrgUnit_Equip
cfOrganisationUnit_Event	cfOrgUnit_Event
cfOrganisationUnit_ExpertiseAndSkills	cfOrgUnit_ExpSkills
cfOrganisationUnit_Facility	cfOrgUnit_Facil
cfOrganisationUnit_Funding	cfOrgUnit_Fund
cfOrganisationUnit_OrganisationUnit	cfOrgUnit_OrgUnit
cfOrganisationUnit_PostAddress	cfOrgUnit_PAddr
cfOrganisationUnit_PrizeAward	cfOrgUnit_Prize
cfOrganisationUnit_ResultPatent	cfOrgUnit_ResPat
cfOrganisationUnit_ResultProduct	cfOrgUnit_ResProd
cfOrganisationUnit_ResultPublication	cfOrgUnit_ResPubl
cfOrganisationUnit_Service	cfOrgUnit_Srv
cfOrganisationUnitKeywords	cfOrgUnitKeyw
cfOrganisationUnitName	cfOrgUnitName
cfOrganisationUnitResearchActivity	cfOrgUnitResAct
cfPerson	cfPers
cfPerson_Classification	cfPers_Class
cfPerson_Country	cfPers_Country
cfPerson_CurriculumVitae	cfPers_CV
cfPerson_DublinCore	cfPers_DC
cfPerson_ElectronicAddress	cfPers_EAddr
cfPerson_Equipment	cfPers_Equip
cfPerson_Event	cfPers_Event
cfPerson_ExpertiseAndSkills	cfPers_ExpSkills
cfPerson_Facility	cfPers_Facil
cfPerson_Funding	cfPers_Fund
cfPerson_Language	cfPers_Language
cfPerson_OrganisationUnit	cfPers_OrgUnit
cfPerson_Person	cfPers_Pers
cfPerson_PostAddress	cfPers_PAddr
cfPerson_PrizeAward	cfPers_Prize
cfPerson_Qualification	cfPers_Qual
cfPerson_ResultPatent	cfPers_ResPat
cfPerson_ResultProduct	cfPers_ResProd
cfPerson_ResultPublication	cfPers_ResPubl
cfPerson_Service	cfPers_Serv
cfPersonKeywords	cfPersKeyw
cfPersonName	cfPersName
cfPersonName_Person	cfPersName_Pers
cfPersonResearchInterest	cfPersResInt
cfPostAddress	cfPAddr
cfPostAddress_Classification	cfPAddr_Class
cfPrizeAward	cfPrize
cfPrizeAward_Classification	cfPrize_Class
cfProject	cfProj
cfProject_Classification	cfProj_Class
cfProject_DublinCore	cfProj_DC
cfProject_Equipment	cfProj_Equip
cfProject_Event	cfProj_Event
cfProject_Facility	cfProj_Facil
cfProject_Funding	cfProj_Fund
cfProject_OrganisationUnit	cfProj_OrgUnit
cfProject_Person	cfProj_Pers
cfProject_PrizeAward	cfProj_Prize
cfProject_Project	cfProj_Proj

cfProject_ResultPatent	cfProj_ResPat
cfProject_ResultProduct	cfProj_ResProd
cfProject_ResultPublication	cfProj_ResPubl
cfProject_Service	cfProj_Srv
cfProjectAbstract	cfProjAbstr
cfProjectKeywords	cfProjKeyw
cfProjectTitle	cfProjTitle
cfQualification	cfQual
cfQualification_Classification	cfQual_Class
cfQualificationDescription	cfQualDescr
cfQualificationKeywords	cfQualKeyw
cfResultPatent	cfResPat
cfResultPatent_Classification	cfResPat_Class
cfResultPatent_Funding	cfResPat_Fund
cfResultPatent_ResultPatent	cfResPat_ResPat
cfResultPatentAbstract	cfResPatAbstr
cfResultPatentKeywords	cfResPatKeyw
cfResultPatentTitle	cfResPatTitle
cfResultProduct	cfResProd
cfResultProduct_Classification	cfResProd_Class
cfResultProduct_Funding	cfResProd_Fund
cfResultProduct_ResultProduct	cfResProd_ResProd
cfResultProductDescription	cfResProdDescr
cfResultProductKeywords	cfResProdKeyw
cfResultProductName	cfResProdName
cfResultPublication	cfResPubl
cfResultPublication_Citation	cfResPubl_Cite
cfResultPublication_Classification	cfResPubl_Class
cfResultPublication_DublinCore	cfResPubl_DC
cfResultPublication_Funding	cfResPubl_Fund
cfResultPublication_Equipment	cfResPubl_Equip
cfResultPublication_Event	cfResPubl_Event
cfResPubl_Facility	cfResPubl_Facil
cfResPubl_Funding	cfResPubl_Fund
cfResPubl_Metrics	cfResPubl_Metrics
cfResPubl_ResultPatent	cfResPubl_ResPat
cfResPubl_ResultProduct	cfResPubl_ResProd
cfResultPublication_ResultPublication	cfResPubl_ResPubl
cfResultPublicationAbstract	cfResPublAbstr
cfResultPublicationBibliographicNote	cfResPublBiblNote
cfResultPublicationKeywords	cfResPublKeyw
cfResultPublicationNameAbbreviation	cfResPublNameAbbrev
cfResultPublicationSubtitle	cfResPublSubtitle
cfResultPublicationTitle	cfResPublTitle
cfService	cfSrv
cfService_Classification	cfSrv_Class
cfService_Funding	cfSrv_Fund
cfServiceDescription	cfSrvDescr
cfServiceKeywords	cfSrvKeyw
cfServiceName	cfSrvName

9. References

[1] Jörg, B.; Jeffery, K.G.; Dvorak, J.; Nikos Houssos; Asserson, A.; van Grootel, G.; Gartner, R.; Cox, M.; Rasmussen, H.; Vestdam, T.; Strijbosch, L.; Brasse, V.; Zendulkova, D.; Höllrigl, T.; Valkovic, L.; Engfer, A.; Jägerhorn, M.; Mahey, M.; Brennan, N.; Sicilia, M.-A.; Ruiz-Rube, I.; Baker, D.; Evans, K.; Price, A.; Zielinski, M. (2012): CERIF 1.3 Full Data Model (FDM): Introduction and Specification. euroCRIS, January 2012.

[2] Jörg, B.; Jeffery, K.G.; Houssos, N.; Dvořák, J. ; Brasse, V.; Höllrigl, T.; Asserson, A.; Rasmussen, H.; Zendulkova, D.; Price, A.; Sicilia, M.A.; Ruiz-Rube, I.; van Grootel, G.; Baker, D.; Evans, K.; Zielinski, M.; Vestam, T.; Strijbosch, L.; Cox, M.; Elbæk, M.K.; Voigt, R.; Simons, E.J. (2012): CERIF – 1.3 Semantics: Research Vocabulary. euroCRIS, January 2012.

[3] W3C Recommendation: Extensible Markup Language (XML) 1.0, Fourth Edition, 16 August 2006, edited in place, 29 September 2006. http://www.w3.org/TR/2006/Rec-xml-2006-08-16/

[4] W3C XML Schema: http://www.w3.org/XML/Schema