

Testing metadata compatibility

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Abstract: *Metadata is defined in Directive INSPIRE at Art. 3, point (6) as: “information describing spatial data sets and spatial data services and making it possible to discover, inventory and use them.” This paper includes a description of a spatial data set in compliance with the INSPIRE specifications. An analysis of the possibility to achieve metadata has been performed by using three different solutions: ArcCatalog, CatMDEdit and INSPIRE Metadata Editor. There has also been included a study concerning the compatibility between the exchange and update of the information comprised in the metadata by using three different solutions: ArcCatalog, CatMDEdit and INSPIRE Metadata Editor.*

Keywords: *metadata, data, XML, INSPIRE, geospatial, compatibility;*

1. Introduction

A traditional description of GIS data is that it is more than a computerized map, and it is more than just a database: it is information about spatial location and relationships (coordinates, topology) and attribute (descriptive) information about geographic features in database format. However, this description is incomplete without metadata. Metadata is defined as background information that describes the content, quality, condition and other appropriate characteristics of the data. Metadata is a simple mechanism to inform others of the existence of data sets, their purpose and scope. In essence, metadata answer *who, what, when, where, why* and *how* questions about all facets of the data. Metadata are also used to publish the information about data sets on the Internet so that users can find them. Because there are many data providers for spatial data it is good practice to use a standardized format to publish the metadata in. There is a metadata standard for spatial information by ISO(*International Organization for Standardization*) in ISO19115. INSPIRE(*Infrastructure for Spatial Information in Europe*) adopted this standard and defined a profile, a subset of all the elements in the standard, as a minimum requirement to publish spatial data in Europe. The standard ISO 19139 provides the XML implementation schema for ISO 19115 specifying the metadata record format and may be used to describe, validate, and exchange geospatial metadata prepared in XML.

2. Metadata software tools

In order to create metadata, to test the compatibility between the generated XML files and the possibility to exchange and update the information comprised in the metadata, we have used three different solutions: *ArcCatalog*, *CatMDEdit* and *INSPIRE Metadata Editor*.

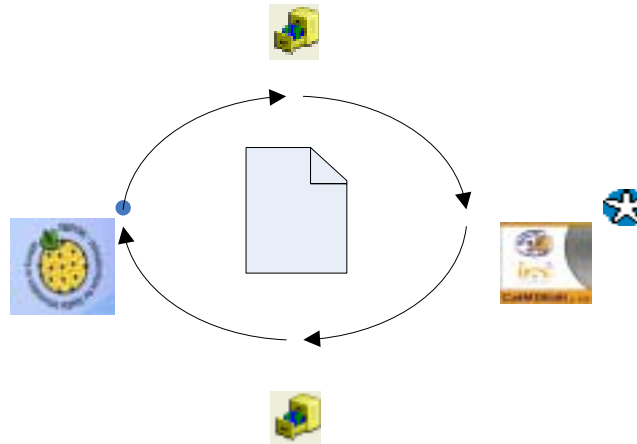


Fig 1. View of the XML metadata file with the three tools;

INSPIRE Metadata Editor Version 1.01 is a *prototype editor* that allows users to create metadata compliant with COMMISSION REGULATION (EC) No 1205/2008 of 3 December 2008, (INSPIRE Metadata Implementing Rules). The metadata created with this editor are also compliant with EN ISO 19115 and 19119, and have been successfully validated against the INSPIRE Geoportal Catalogue and other catalogue applications. The editor allows users to validate the metadata created and save the metadata record as an XML file on a local machine. INSPIRE notice that this version of the editor does not support the possibility to manage existing ISO metadata without losing elements that are not part of the INSPIRE Implementing Rules.

ArcCatalog is an ArcInfo(*commercial software*) application for browsing, organizing, distributing, and documenting (metadata) spatial data. *ArcInfo* (formerly called *ARC/INFO*) is a full-featured geographic information system produced by *ESRI*.

CatMDEdit is a *free software* developed by the The Advanced Information Systems group of the University of Zaragoza and GeoSpatiumLab S.L.

3. Metadata transfer

3.1. Creating metadata by using the INSPIRE Meta-data Editor for the data set

The metadata were organized based on the ten main information groups(sections):

- Identification information
- Classification of spatial data
- Keywords that describe the resource
- Geographic Bounding Box
- Temporal reference information
- Quality & Validity information
- Conformity statement information
- Conditions applying to access and use

- Organizations responsible for the establishment, management, maintenance and distribution of spatial data sets
- Metadata reference information

This ten sections contains different metadata element or group of metadata elements(with sub-elements). The compound elements contains one or more data entry fields.

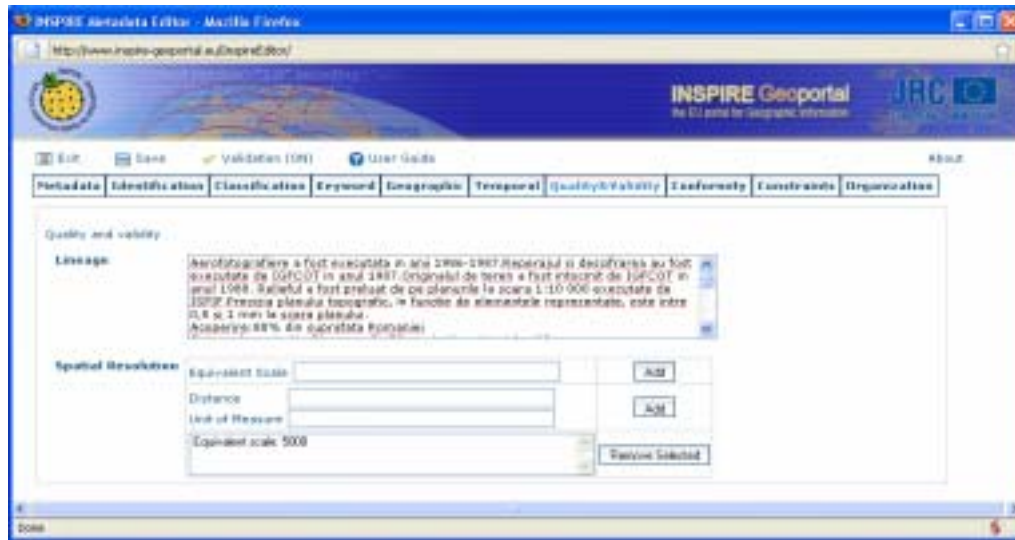


Fig 2. INSPIRE Metadata Editor Version 1.01;

The original metadata file is created by using the INSPIRE Meta-data Editor and it is saved in a XML format.

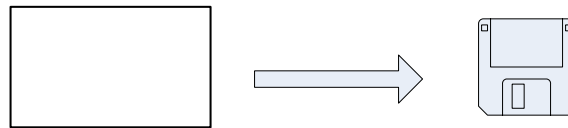


Fig 3. Metadata export file in XML format;

The metadata file is imported in ArcGIS, respectively at the ArcCatalog level. The meta-data are attached to an existing database. As it can be noticed in Fig.4, the data mentioned within the metadata editor have been transferred to the corresponding sections in ArcCatalog and can be viewed only in the ISO 19139 format.

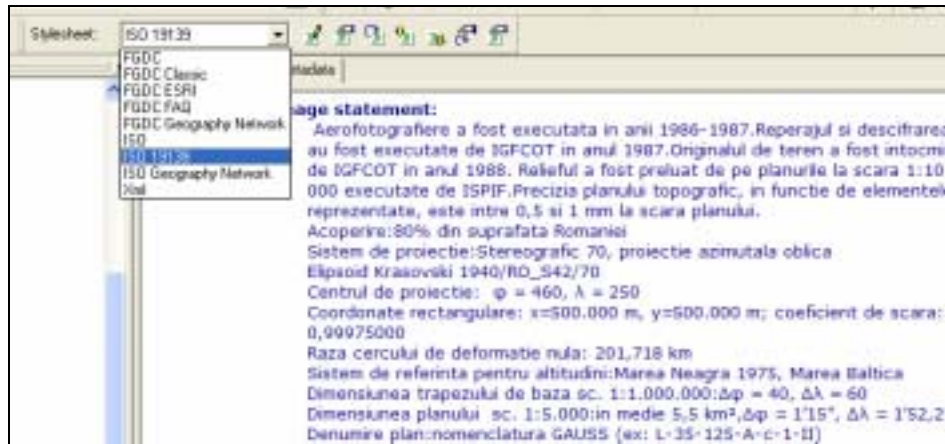


Fig 4. Selection for the way of viewing the metadata in ArcCatalog;

Fig.5 represents the existing database and the attached metadata. In the section *Distribution Information* which refers to details related to the data distribution, we do not have information regarding the data set format and version. The other information have been automatically taken from the structure of the file generated by the INSPIRE metadata editor from the *Identification* section.

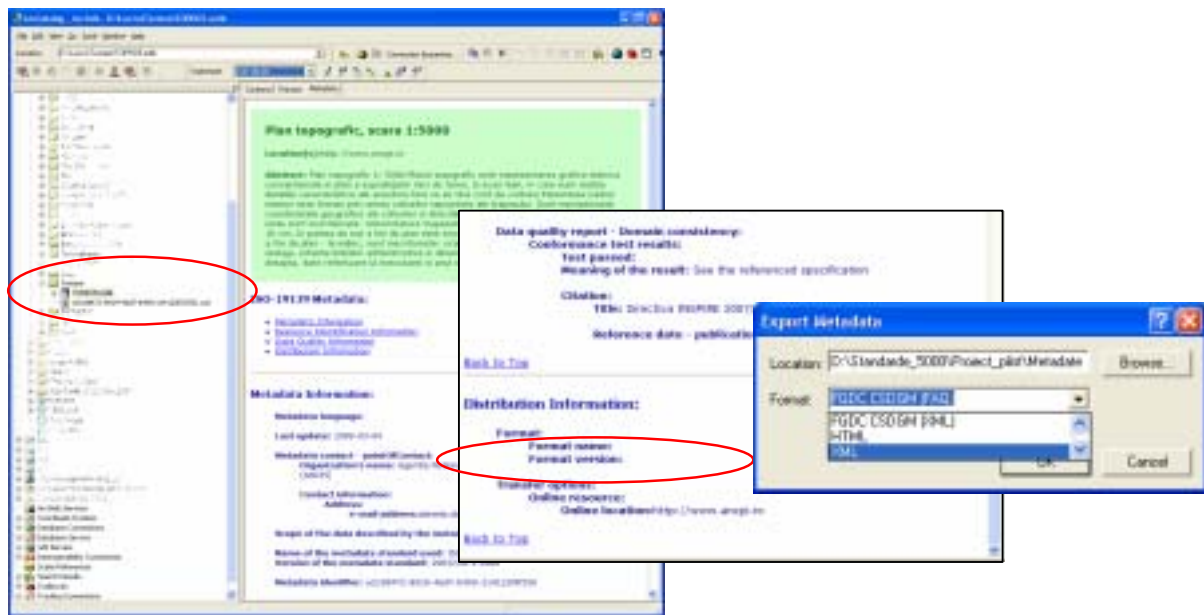


Fig.5 Metadata in ArcCatalog , content detail and the metadata export in XML format;

The metadata are exported in XML format and they are again uploaded *INSPIRE Metadata Editor*. The information are kept as a result of the mentioned testing stages, but the information newly added in the ArcCatalog, related to the data format, cannot be viewed. The next stage is represented by the file reading by using the CatMDEdit software.

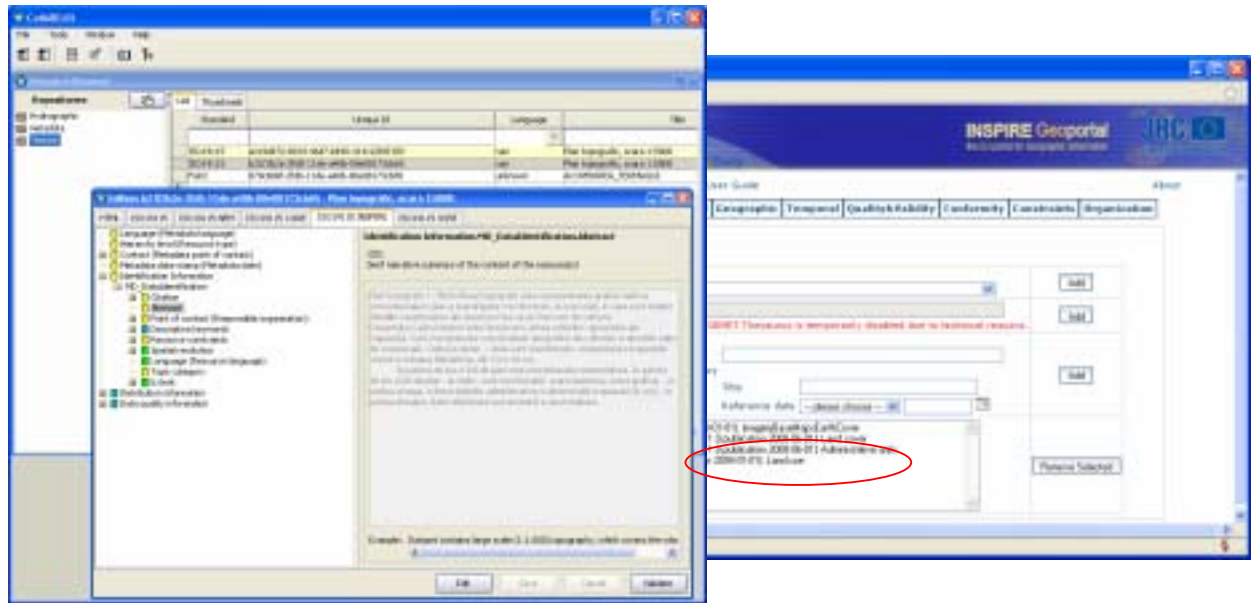


Fig.6 Metadata in CatMDEdit and view of the modifications in INSPIRE Metadata Editor ;

The information can be read and modified. In the section referring to the words describing the data set (*Identification Information, Descriptive keywords*), we have added the word *Landuse* (INSPIRE theme). The modified metadata file is exported in XML format (ISO 19115) and it is opened with *INSPIRE Metadata Editor*. The updated information (*Landuse*) can be read in the *Keyword* section.

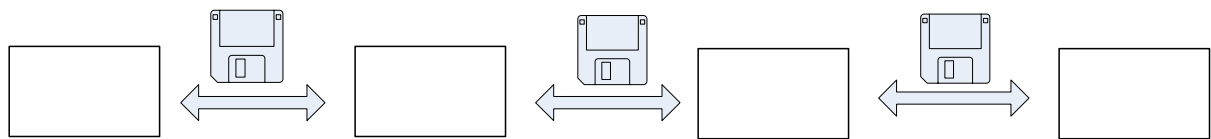


Fig.7 Stages of testing the meta-data created with INSPIRE Metadata Editor;

The metadata Editor existing on the **INSPIRE** portal offers the possibility to create XML metadata files, which should be attached to each data set or set series.

Advantages:

- It complies with INSPIRE Directive
- It is easy to use
- It generates metadata at the level of the data sets, series of data sets and spatial data services
- The generated XML files can be integrated in CatMDEdit and in ArcCatalog

Disadvantages:

- Low number of sections in the metadata
- There are no special sections for the distribution of the data and of the services
- Application available only on the INSPIRE Geoportal

3.2. Creating metadata by using ArcCatalog for the data set

The original metadata file is created by using ArcCatalog and it is saved in a XML format XML.

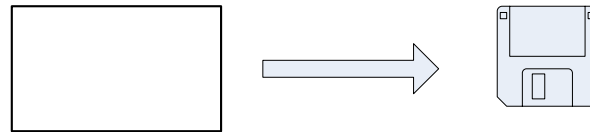


Fig.8 Metadata file export in a XML format;

The resulting file cannot be viewed with *INSPIRE Metadata Editor*.



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Fig.9 Error message in *INSPIRE Metadata Editor*;

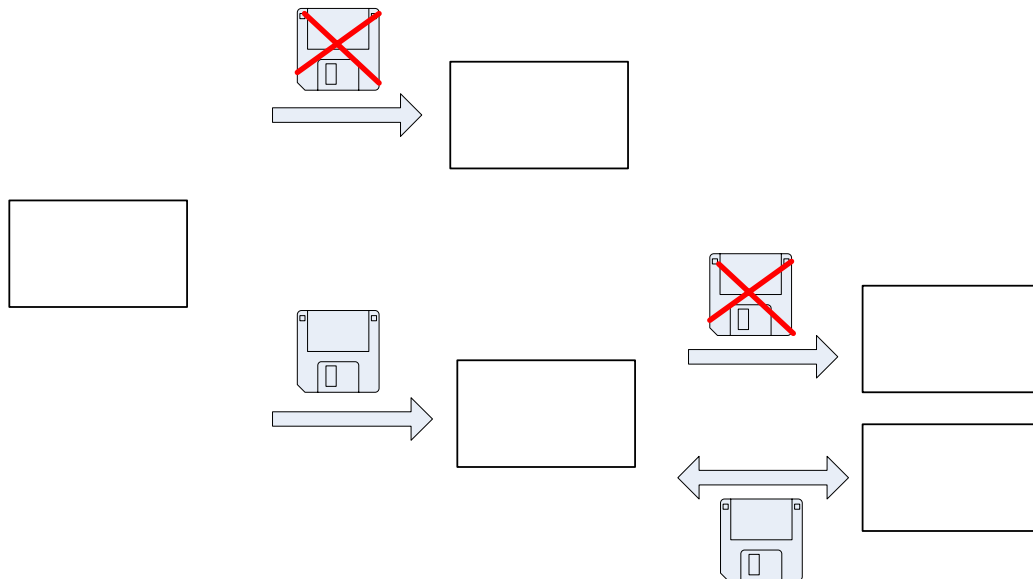


Fig.10 Stages of testing the metadata created with ArcCatalog;

Advantages:

- They can be automatically attached to the data set, this allowing a more severe control in administrating the metadata files

- Some information from the metadata can be updated in real time
- They are automatically created at the level of elements class and they make the metadata editing activity more efficient for the series of data sets
- The metadata are created in the same environment as that for the spatial data
- They are attached to the spatial data editing software
- They are appropriate for the application on the INSPIRE geoportal

Disadvantages:

- It is a commercial software
- Medium difficulty degree in use
- Possible incompatibilities with other *opensource* softwares

3.3. Creating metadata by using CatMDEdit for the data set

The original metadata file is created by using CatMDEdit and it is saved in a XML format. The resulting file can be uploaded and can be viewed in ArcCatalog, but the metadata cannot be viewed in *INSPIRE Metadata Editor*.



Fig.11 Metadata file export in a XML format;

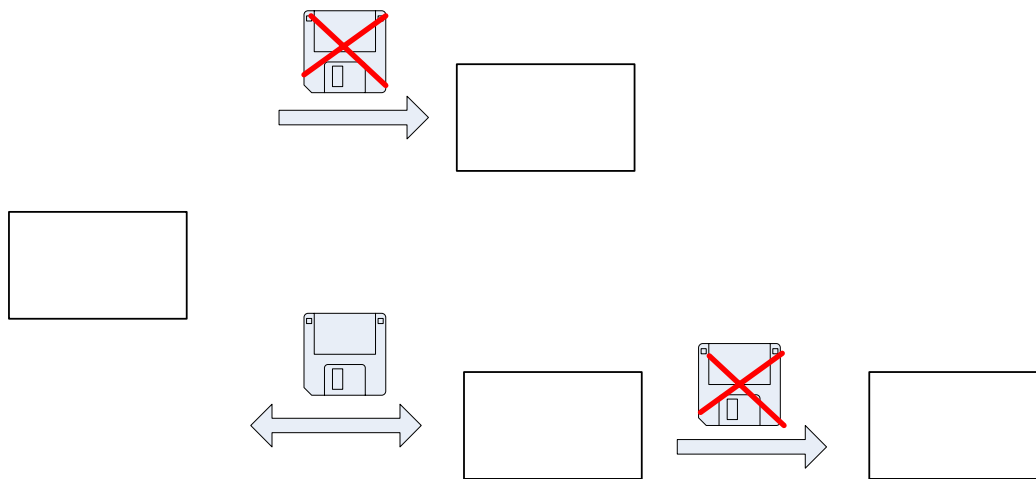


Fig.12 Stages of testing the metadata created with CatMDEdit;

Advantages:

- It includes all the sections of interest for metadata
- It is an *opensource* software
- Compatible with ArcCatalog

CatMDEdit

Disadvantages:

- Medium difficulty degree in use
- Possible incompatibilities with other *opensource* softwares or with the application existing on the INSPIRE geoportal

4. Conclusions and proposals

From *the data producer's* point of view, it is important to establish the metadata format and the level for which the metadata are created (at the data set level or at the level of the data sets series) because this aspect directly influences the volume of work in producing them and the details made available for the data users. Metadata are preferred to be created in the same environment as that for creating the spatial data, if the software in which they are produced offers the specific tools. Thus, administrating and updating the metadata can be achieved more efficiently.

From *the data user's* point of view, the metadata structure and format are important. The metadata created at the data set level or at the level of data sets series may have a different detailing degree, especially for the information referring to the data quality.

For both of them, it is important to make the selection of the metadata editing, updating and administrating "support", because, as a result of these compatibility tests, some information can be lost or, simply, the information cannot be viewed with the different available softwares.

5. References

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