

## **An Ontology Based Approach for the Construction of an Address Gazetteer: the IDEZAR Gazetteer Use-case**

J. Nogueras-Iso, F. J. López, J. Lacasta, F. J. Zarazaga-Soria, P.R. Muro-Medrano  
*Computer Science and Systems Engineering Department, University of Zaragoza, Zaragoza, Spain*

Visser, P.R.S., Jones, D.M., Bench-Capon, T.J.M., Shave, M.J.R.: An Analysis of Ontological In order to create the contents of an address gazetteer service that forms part of the Spatial Data Infrastructure (SDI) of local administrations such as a city council, the SDI developers must perform a work of analyzing and harmonizing all the existent repositories containing address information in the different offices of the council.

In our case, we have faced the problem of creating an address gazetteer service for the Zaragoza council SDI [Portoles-Rodríguez et al., 2005], which is specialized in the Urban Networks of this city. And analyzing the information related with addresses and urban transport networks in the Spanish local administration, we have faced that different taxonomies are used for the identification of urban network feature types in different administrative processes. For instance, one of these taxonomies is the one used in the central database repository managed by the council Informatics office. However, when the city council needs to exchange information with external organizations like the National Cadastre Office or the National Statistics Institute, the information needs to be reformatted in order to comply with the feature types accepted by these institutions. Moreover, it is usual that this reformatted information is stored in parallel repositories (e.g., tax office databases, urban planning office databases) whose updates are not synchronized with the central repository.

In order to overcome this existent heterogeneity in the different repositories, it seems sensible to establish a unified model of the feature types that can be found in this domain, and make the necessary mappings to the particular taxonomies that must be used in external organizations or in the different repositories maintained at council level. This feature type model could be formally represented by an ontology that defines explicitly the concepts and relationships between these concepts in a domain [Gómez-Pérez et al, 2003; Visser et al., 1997].

Having observed this necessity of defining an ontology for feature types in the urban networks domain, the objectives of this work are three-fold. The first objective is to analyze the different taxonomies in the public administration for urban networks [Levoleger and Corbin, 2005].

The second objective is to use these source taxonomies in order to define later a unified urban network ontology overcoming the existent heterogeneity. On the one hand, this unified ontology will facilitate the interoperability with external administrative organizations. And on the other hand, it will enable the modelling of the contents served by the Gazetteer service in the Zaragoza council SDI (IDEZAR, <http://www.zaragoza.es/idezar/>).

And the third and final objective is to use this experience of defining this unified ontology in order to provide some guidelines for the construction of ontologies. More specifically this work will provide feedback to the Towntology project (<http://www.towntology.net>). This project is funded by COST (intergovernmental framework for European Cooperation in the field of Scientific and Technical Research) through the action COST C21 in the Urban Civil Engineering (UCE) domain and it aims at increasing to increase the knowledge and promote the use of ontologies in the domain of Urban Civil Engineering projects [Teller et al., 2005], in the view of facilitating the communications between information systems, stakeholders and UCE specialists at a European level (Groupware).

The full paper version of this contribution will analyze the use-case selected for this work explaining the different urban network databases (including their different feature type taxonomies) that must be used for the creation of a gazetteer. Then, it will be described how the contents of the gazetteer can be created using two different approaches. Whereas the first approach will describe an ad-hoc manual mapping among taxonomies used in the source repositories, the second one will describe how to establish a formal urban network ontology that integrates the mappings among the different taxonomies. For the

formalization of the ontology in this second approach we will explore the use of ontology editing tools like Towntology [Keita et al., 2004] (visual tool to facilitate the discussion among experts of the ontology construction) or Protegé [Noy et al., 2000] (enabling the use of more formal language specifications). The main aim of this experimental part of the work is to demonstrate that the second approach provides more flexibility and scalability, facilitating the upload process and possible future extensions.

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European Commission  
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Spatial Data Infrastructures Unit  
I-21020 Ispra (VA), Italy

#### Contact information

Tel.: +0039 0332 786491  
Fax: +0039 0332 789803

E-mail: [ies@jrc.it](mailto:ies@jrc.it)

Website: <http://ies.jrc.ec.eu.int/>

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## Contents

<b>SESSION: SDI</b>	<b>1</b>
INSPIRE FROM THE NATIONAL AND REGIONAL PERSPECTIVE: SURVEY AMONG THE SDI STAKEHOLDERS IN THE CZECH REPUBLIC	2
<i>E. Pauknerova, P. Tryhubova</i>	
THE SPIRIT OF INSPIRE LIVES IN THE AUSTRIAN MINISTRY OF LIFE	5
<i>F. Lux, W. Fahrner, T. Zelenka</i>	
WILL INSPIRE COME UP TO ALL EXPECTATIONS?	7
<i>R. Gissing</i>	
SDI SOCIAL AND ECONOMIC IMPACT USERS' PERSPECTIVE	8
<i>F. Salgé, J. Geirinhas, S. Gizzi</i>	
FRAMING THE EVOLUTION OF SPATIAL DATA INFRASTRUCTURES	10
<i>M. Wachowicz, A. Bregt and J. Crompvoets.</i>	
<b>SESSION: PEER GROUP</b>	<b>13</b>
THE IMPORTANCE OF GEOGRAPHIC INFORMATION IN BIODIVERSITY AND NATURE CONSERVATION	14
<i>R.A. Wadsworth, A. Watt</i>	
SETTING UP A GI RESEARCH AGENDA FOR ENVIRONMENTAL MANAGEMENT: THE PEER EXPERIENCE	16
<i>M. Wachowicz<sup>1</sup> and S. Labbé<sup>2</sup></i>	
LANDSCAPE CHARACTER ASSESSMENT AS A BASIS FOR PLANNING AND DESIGNING SUSTAINABLE LAND USE IN EUROPE	18
<i>D. Wascher, M. Perez-Soba &amp; S. Múcher</i>	
EUROPEAN ENVIRONMENT AGENCY SDI – PROGRESS AND PLANS TO SUPPORT THE IMPLEMENTATION OF A SHARED ENVIRONMENTAL INFORMATION SYSTEM	20
<i>M.P. Lund, J. Bliki, A. Sousa, M. Erhard, T. Jessen, C. Steenmans</i>	
CONTAMINATED ENVIRONMENTS, RISK ASSESSMENT AND REMEDIATION STRATEGIES	21
<i>B. Münier, S. Gyldenkerne, P.B. Sørensen, M. Thomsen, P. Fauser</i>	
<b>SESSION: NATIONAL SDI</b>	<b>23</b>
PORTALU – A NEW NATIONWIDE PORTAL TO ENVIRONMENTAL INFORMATION IN GERMANY	24
<i>T. Vögele, M. Klenke, F. Kruse</i>	
GI & SDI AS PART OF NATIONAL AND FEDERAL eGOVERNMENT– STATUS AND PERSPECTIVE FOR THE WORK OF THE CHAMBERS OF COMMERCE AND INDUSTRY	27
<i>A. Fritzsche,</i>	
GEODATA DISTRIBUTION NATIONWIDE - GEOPORTAL OF CZECH LAND SURVEY OFFICE	30
<i>R. Widz, J. Havas, V. Spacek, J. Svaty</i>	
THE SPANISH SDI: FROM TECHNOLOGICAL TO ORGANIZATIONAL ASPECTS	31
<i>A.Rodríguez, P.Abad, E.López, A. Sánchez, J.A. Alonso</i>	
STRENGTHS AND WEAKNESSES IN GEOSPATIAL DATA INFRASTRUCTURE IN ROMANIA	33
<i>A. Ionita, I. Nedelcu, S. Andrei, V. Chendes, V. Craciunescu, M. Bichir, V. Gancz</i>	
<b>SESSION: METADATA AND CATALOGUES</b>	<b>35</b>
DISTRIBUTED METADATA CATALOGUES THEORY VS. REALITY	36
<i>I. Kanellopoulos, M. Millot, L. Bernard, K. Senkler, U. Voges</i>	
NEAR-TERM METADATA CHALLENGES	37
<i>M. Gould, J. Rocha, S. Nativi, J. Nogueras, M. Manso</i>	
STANDARDS-BASED APPROACHES TO PUBLISHING AND ACCESSING CONTENT IN SPATIAL DATA INFRASTRUCTURES	39
<i>C. Portele, R. Erstling</i>	
STYLEDCAT: DEFINITION OF A SLD CATALOGUE	41
<i>A.Maldonado, M.A.Bernabé, M.A.Manso, M.C.Muñoz, M.Manrique</i>	
DISTRIBUTED DATA MANAGEMENT IN INTERNET MAP SERVICES EXPERIENCES FROM LOUNAIKKA THEMATIC ATLAS	44
<i>A. Vasanen1, T. Toivonen2</i>	

<b>SESSION NATIONAL SDI II</b>	<b>47</b>
OVERVIEW OF THE INSPIRE THEMES – EXEMPLIFIED THROUGH RUNNING NATIONAL SERVICES IN THE NORWEGIAN SDI	48
<i>A. Lillethun</i>	
SWEDISH PREPARATIONS FOR INSPIRE	50
<i>S. Jönsson, U. Sandgren</i>	
INSPIRE AND DANISH E-GOVERNMENT INITIATIVES SYNERGY OR CONFLICT	52
<i>J. Ryttersgaard</i>	
SOCIAL AND ECONOMIC BENEFITS FROM COMPILING THE FOREST DATA BANK PROJECT (DASOLOGIO) IN GREECE	54
<i>D.S. Palaskas, N.I. Stamou</i>	
RAVI AND THE DUTCH NATIONAL CLEARINGHOUSE ARE SHARING DUTCH INSPIRE	56
<i>B.C. Kok, M. Reuvers</i>	
<b>SDI TECHNOLOGY</b>	<b>57</b>
“WHERE WOULD YOU GO FOR MAPPING SERVICES, [NMAS] OR GOOGLE MAPS?” IMPLEMENTING “HACKABLE” USER-DRIVEN GI SERVICES WITHIN SDIS	58
<i>G. Barrotta, P. Cipriano, S. Pezzi, L. Zanella</i>	
CSCAT: CATALOGUE OF COORDINATE REFERENCE SYSTEM DEFINITION AND TRANSLATION WEB SERVICE	60
<i>M.A. Manso, M.A. Bernabé</i>	
THE ROLE OF FREE SOFTWARE THICK CLIENTS IN SDI: CASE OF gvSIG	62
<i>M. Gould, C. Granell, M.A. Esbrí, G. Carrión</i>	
HOW TO MOVE FORWARD IN IMPLEMENTING SDIS WITH SOA?	63
<i>Ç. Cömert, H. Akıncı</i>	
PROVIDING WFD REPORTING OVER SDI SERVICES	65
<i>M. Á. Latre, R. Béjar, J. A. Álvarez, O. Castillo, P. R. Muro-Medrano</i>	
<b>NATIONAL / REGIONAL SDI I</b>	<b>69</b>
OUT SPIRE	70
<i>S. Carlyle, M. Clark</i>	
DEVELOPMENT OF A DANISH INFRASTRUCTURE FOR SPATIAL INFORMATION (DAISI) - GOALS AND MEANS	72
<i>H. Brande-Lavridsen, B.H. Jensen</i>	
REACHING OUT AND UNDER	74
<i>I. Jackson</i>	
EU-PROJECT: CROSS-BORDER SPATIAL INFORMATION SYSTEM WITH HIGH ADDED VALUE (CROSS-SIS)	77
<i>J. Riecken</i>	
GEOINFORMATICS AND GISCIENCE EDUCATION: UNIGIS AS SDI BRAINWARE	79
<i>J. Strobl</i>	
<b>SESSION: DATA HARMONISATION</b>	<b>81</b>
AN ONTOLOGY BASED APPROACH FOR THE CONSTRUCTION OF AN ADDRESS GAZETTEER: THE IDEZAR GAZETTEER USE-CASE	82
<i>J. Nogueras-Iso, F. J. López, J. Lacasta, F. J. Zarazaga-Soria, P.R. Muro-Medrano</i>	
EUROADS’ CONTRIBUTION TO THE IMPLEMENTATION OF INSPIRE	84
<i>U.L. Sandgren</i>	
A NEW PRODUCTION PARADIGM BASED ON A SDI	86
<i>P. Trevelyan, G. Mallin, Jeremy Tandy</i>	
‘FEATURE/OBJECT DATA MODELS’ – A REPORT ON THE EUROSDR/EUROGEOGRAPHICS WORKSHOP, 24-25 APRIL 2006	87
<i>P. Woodsford, A. Illert, K. Murray, C. Portele, M. Seifert</i>	
DATA CERTIFICATION AND SPATIAL DATA QUALITY MANAGEMENT	95
<i>M. Sanderson</i>	

<b>SESSION: NATIONAL / REGIONAL SDI II</b>	<b>101</b>
LOUNAISPAIKKA REGIONAL GI SERVICE AND COLLABORATION INITIATIVE BUILDING A LSDI IN SOUTH WESTERN FINLAND	102
<i>L. Nurmi, A. Vasanen</i>	
STANDARDS FOR DATA AND METADATA SHARING IN ITALY: THE SIGMA TER INFRASTRUCTURE	105
<i>G. Ciardi, P. Cipriano</i>	
ASSESSING THE IMPLEMENTATION OF A X-BORDER SPATIAL DATA INFRASTRUCTURE IN THE EUREGIO MAAS RHINE	107
<i>J.D. Bulens, J. Crompvoets, F.R. Kooij, L.A.E. Vullings, A. Ligtenberg</i>	
SITAD: FROM A REGIONAL SDI TO A MODEL FOR DELIVERING CROSS-BORDER INFORMATION ON GEOGRAPHICAL DATA	110
<i>L. Garretti, S.Griffa, R. Lucà</i>	
<b>SESSION: SDI IMPACTS</b>	<b>113</b>
A ROAMING-ENABLED SDI (RSDI) OR THE RELATIONSHIP BETWEEN TECHNOLOGY AND MARKET PRESENCE	114
<i>R.M. Wagner, A. Remke</i>	
TRANSPARENCY OF ACCESSIBILITY TO GOVERNMENT-OWNED GEO-INFORMATION	116
<i>F. Welle Donker, B. van Loenen</i>	
MOTIIVE EXPERIENCES USING SIMULATION SOFTWARE TO ASSESS SDI COST-BENEFIT	125
<i>R.A. Longhorn</i>	
TOWARDS THE SOCIO-ECONOMIC ASSESSMENT OF SPATIAL DATA INFRASTRUCTURES	127
<i>M. Craglia, J. Nowak</i>	
<b>SESSION: REGIONAL SDI</b>	<b>129</b>
S. I. T. R. TERRITORIAL INFORMATION SYSTEM OF SARDINIA	130
<i>G.Pittau, R.Vinelli, M.Salvemini, L.Corvetto</i>	
HOW MUNICIPALITIES ARE JOINING REGIONAL SDI: FIRST RESULTS AND CONCLUSIONS	133
<i>J. Guimet Perenya,</i>	
NAVARRA IN INSPIRE. INTEGRATION OF SDI AT REGIONAL (IDENA) AND LOCAL (IDEPAMPLONA) LEVEL	134
<i>M. Cabello, P. Echamendi, M.A. Jiménez de Cisneros, A. Valentín</i>	
REGIO-GEO.CH – INTER-REGIONAL SPATIAL DATA HUB WITH AUTOMATED DATA SHARING AND QUALITY CONTROL	136
<i>A. Bernath</i>	
<b>SESSION: DATA SHARING.....</b>	<b>137</b>
ELIMINATING OBSTACLES AT THE POINT OF USE: SHARING ORDNANCE SURVEY DATA AMONG PUBLIC AUTHORITIES IN GREAT BRITAIN	138
<i>C. Hadley, N. Sutherland</i>	
INSPIRE AND INTELLECTUAL PROPERTY RIGHTS – A THUNDERSTORM OR A TEMPEST IN A TEAPOT?	139
<i>K. Janssen</i>	
DATA LENDING FACILITY – THE INNOVATIVE DOWNLOAD SERVICE OF THE FINNISH NSDI	141
<i>T. Toivonen, R. Kalliola &amp; E. Ennola</i>	
AVAILABILITY OF GOVERNMENTAL GEO-INFORMATION, COMPLICATIONS IN PRACTICE	144
<i>H. Nobbe</i>	
<b>SESSION: CLOSING PLENARY AND WRAP-UP</b>	<b>145</b>
HOW TO KEEP REBUILDING A SDI ? – THE PORTUGUESE EXPERIENCE	146
<i>R. P. Julião</i>	146



<b>SESSION: POSTERS</b>	<b>147</b>
THE MEDWET WEB INFORMATION SYSTEM: AN SDI APPLICATION <i>L. Hatzjiordanou, P. Katsaros</i>	148
CAGI AND ITS CONTEMPORARY ACTIVITIES <i>J. Hiess</i>	149
GIBSER WORKSHOPS - CBC GIS LESSONS <i><sup>1</sup>F. Hoffmann, J. Hiess</i>	150
INSPIRE AGAINST THE BACKGROUND OF SUSTAINABLE DEVELOPMENT, DPSIR AND AIR MONITORING <i>W. Pazdan</i>	151
X-BORDER GDI NRW - NL <i>K. van Raamsdonk</i>	153
ENVIRONMENTAL DATA SHARING OPPORTUNITIES – ESTONIAN ENVIRONMENTAL REGISTER <i>K. Liiv, T. Dišlis</i>	157
LOCAL SPATIAL DATA INFRASTRUCTURES – THE NEXT STEP FOR MUNICIPAL GIS <i>R. P. Julião, R. Dias</i>	158
MUNICIPAL ENVIRONMENTAL-MONITORING SYSTEM <i>F. Speiser, I. Magyar, R. Jamniczky, Á. Rédey</i>	159
WIN: A NEW GEO-INFORMATION ARCHITECTURE FOR RISK MANAGEMENT <i>C. Alegre, H. Sassier, A. Pi Figueroa</i>	160
GEODATA PUBLISHER SERVICE IMPROVES THE AVAILABILITY OF CONTENT IN SPATIAL DATA INFRASTRUCTURES <i>R. Erstling, C. Portele</i>	161