12th EC GI and GIS Workshop, ESDI: From Inspiration to Implementation

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

(Draft) 12th EC-GI&GIS Workshop: ESDI: From Inspiration to Implementation. Innsbruck, Austria, 21-23 June 2006. 2006.

Parallel Sessions Thursday, 22 June 2006

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.

References

- Mismatches: Heterogeneity versus Interoperability. In: AAAI 1997. Spring Symposium on Ontological Engineering, Stanford, USA (1997)
- Alistair, M., Matthews, B., Wilson, M.: SKOS Core: Simple Knowledge Organization for the Web. In: Proceedings of the International Conference on Dublin Core and Metadata Applications, Madrid, Spain (2005)
- Berman, M.L.: Semantic Interoperability and Cultural Specificity: Examples from Chinese, Japanese, Mongolian and Uighur. In: Proc. of Social Science History Association meeting (SSHA'2003), Baltimore (2003)
- Gómez-Pérez, A., Fernández-López, M., Corcho, O.: Ontological Engineering. Springer-Verlag, London (United Kingdom) (2003)
- Keita, A., Laurini, R., Roussey, C., Zimmerman, M.: Towards an Ontology for Urban Planning: The Towntology Project. In: CD-ROM Proceedings of the 24th UDMS Symposium, Chioggia (2004)
- Levoleger, K., Corbin, C.: Survey of European National Addressing as of May 2005, v3. AWP 2005, EUROGI (2005)
- Noy, N.F., Fergerson, R.W., Musen, M.A.: The knowledge model of Protege-2000: Combining interoperability and flexibility. In: 2th International Conference on Knowledge Engineering and Knowledge Management (EKAW'2000), Juan-les-Pins, France (2000)
- Portoles-Rodríguez, D., Álvarez, P., Muro-Medrano, P.: IDEZar: an example of user needs, technological aspects and the institutional framework of a local SDI. In: Proceedings of the 11th EC GI & GIS Workshop, ESDI Setting the Framework.(2005)
- Teller, J., Keita, A.K., Roussey, C., Laurini, R.: Urban Ontologies for an improved communication in urban civil engineering projects. In: Proceedings of the International Conference on Spatial Analysis and GEOmatics, Research & Developments, SAGEO 2005, Avignon, France (2005)



The mission of the JRC is to provide customer-driven scientific and technical support for the conception, development, implementation and monitoring of EU policies. As a service of the European Commission, the JRC functions as a reference centre of science and technology for the Union. Close to the policymaking process, it serves the common interest of the Member States, while being independent of special interests, whether private or national.





http://www.ec-gis.org/Workshops/12ec-gis



ESDI: From Inspiration to Implementation 12th EC-GI&GIS Workshop









EUROPEAN COMMISSION DIRECTORATE-GENERAL Joint Research Centre







12th EC GI & GIS Workshop

12th EC & EC GIS Workshop

Innsbruck, Austria

21-23 June 2006



MISSION STATEMENT

The mission of the Institute for Environment and Sustainability is to provide scientific and technical support to the European Union's policies for protecting the environment and the EU Strategy for Sustainable Development.

European Commission Joint Research Centre (DG JRC) Institute for Environment and Sustainability (IES) Spatial Data Infrastructures Unit I-21020 Ispra (VA), Italy

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

E-mail: ies@jrc.it Website: http://ies.jrc.cec.eu.int/

Editor: Karen Fullerton, Katalin Tóth Cover: José-Joaquín Blasco

Legal Notice

The contents of this document do not necessarily reflect the official opinion of the European Commission or the European Community Institutions. Neither the European Commission nor any person acting on behalf of the Commission is responsible for the use that might be made of the information contained in this production.

A great deal of additional information on the European Union is available on the Internet. It can be accessed through the Europa server <u>http://europa.eu.int</u>

Luxembourg: Office for Official Publications of the European Communities

EUR LB-X1-06-024-EN ISBN 92-79-02083-8

© European Communities, 2006

Reproduction is authorized provided the source is acknowledged

Printed in Austria by Hernegger Offsetdruck GmbH, Innsbruck

Table of Contents

Contents

INSPIRE FROM THE NATIONAL AND REGIONAL PERSPECTIVE: SURVEY AMONG THE SDI	2
<i>E. Pauknerova, P. Tryhubova</i>	2
THE SPIRIT OF INSPIRE LIVES IN THE AUSTRIAN MINISTRY OF LIFE	5
F. Lux, w. Fanrner, 1. Zelenka Will INSPIRE COME UP TO ALL EXPECTATIONS?	7
R. Gissing	0
SDI SOCIAL AND ECONOMIC IMPACT USERS' PERSPECTIVE F. Salsé, I. Geirinhas, S. Gizzi	8
FRAMING THE EVOLUTION OF SPATIAL DATA INFRASTRUCTURES	10
M. Wachowicz, A. Bregt and J. Crompvoets.	
SESSION: PEER GROUP	13
THE IMPORTANCE OF GEOGRAPHIC INFORMATION IN BIODIVERSITY AND NATURE CONSERVATION <i>R.A. Wadsworth, A. Watt</i>	14
SETTING UP A GI RESEARCH AGENDA FOR ENVIRONMENTAL MANAGEMENT: THE PEER EXPERIEN M. Wachowicz ¹ and S. Labbé ²	CE 16
LANDSCAPE CHARACTER ASSESSMENT AS A BASIS FOR PLANNING AND DESIGNING SUSTAINABLE LAND USE IN EUROPE	18
D. wascner, M. Perez-soda & S. Mucner European Environment Agency SDI – progress and plans to support the implementatio	N
OF A SHARED ENVIRONMENTAL INFORMATION SYSTEM	20
M.P. Lund, J. Bliki, A. Sousa, M. Erhard, T. Jessen, C. Steenmans Contaminated Environments, Risk Assessment and Remediation Strategies B. Münier, S. Gyldenkærne, P.B. Sørensen, M. Thomsen, P. Fauser	21
SESSION: NATIONAL SDI	23
PortalU – A New Nationwide Portal to Environmental Information in Germany	24
T. Vögele, M. Klenke, F. Kruse	
GI & SDI AS PART OF NATIONAL AND FEDERAL EGOVERNMENT– STATUS AND PERSPECTIVE FOR TH WORK OF THE CHAMBERS OF COMMERCE AND INDUSTRY A Fritzsche	Е 27
GEODATA DISTRIBUTION NATIONWIDE - GEOPORTAL OF CZECH LAND SURVEY OFFICE R. Widz, J. Havas, V. Spacek, J. Svaty	30
THE SPANISH SDI: FROM TECHNOLOGICAL TO ORGANIZATIONAL ASPECTS	31
A.Koariguez, P.Adaa, E.Lopez, A. Sancnez, J.A. Alonso Strengths and weaknesses in Geospatial Data Infrastructure in Romania A. Ionita, I. Nedelcu, S. Andrei, V. Chendes, V. Craciunescu, M. Bichir, V. Gancz	33
SESSION: METADATA AND CATALOGUES	35
DISTRIBUTED METADATA CATALOGUES THEORY VS. REALITY I. Kanellopoulos. M. Millot. L. Bernard. K. Senkler, U. Voges	36
NEAR-TERM METADATA CHALLENGES M. Gould, J. Rocha, S. Nativi, J. Nogueras, M. Manso	37
STANDARDS-BASED APPROACHES TO PUBLISHING AND ACCESSING CONTENT IN SPATIAL DATA INFRASTRUCTURES	39
C. Portele, R. Erstling	
STYLEDCAT: DEFINITION OF A SLD CATALOGUE A Maldonado M A Bernabé M A Manso M C Muñoz M Manrique	41
DISTRIBUTED DATA MANAGEMENT IN INTERNET MAP SERVICES EXPERIENCES FROM LOUNAISPAIK THEMATIC ATLAS	ка 44

12th EC GI & GIS Workshop, ESDI: from Inspiration to Implementation

SESSION NATIONAL SDI II	47
OVERVIEW OF THE INSPIRE THEMES – EXEMPLIFIED THROUGH RUNNING NATIONAL SERVICES IN THE NORWEGIAN SDI	18
A. Lillethun	40
SWEDISH PREPARATIONS FOR INSPIRE	50
S. Jönsson, U. Sandgren INSPIRE AND DANISH E-GOVERNMENT INITIATIVES SYNERGY OR CONFLICT I. Ryttersegard	52
Social and economic benefits from compiling the Forest Data Bank Project (Dasologio in Greece) 54
D.S. Palaskas, N.I. Stamou RAVI and the Dutch National Clearinghouse are Sharing Dutch INSPIRE B.C. Kok. M. Reuvers	56
SDI TECHNOLOGY	57
"WHERE WOULD YOU GO FOR MAPPING SERVICES, [NMAS] OR GOOGLE MAPS?" IMPLEMENTING "HACKABLE" USER-DRIVEN GI SERVICES WITHIN SDIS	58
CSCAT: CATALOGUE OF COORDINATE REFERENCE SYSTEM DEFINITION AND TRANSLATION WEB SERVICE	60
M.A. Manso, M.A. Bernabé	(2)
THE ROLE OF FREE SOFTWARE THICK CLIENTS IN SDI: CASE OF GVSIG M. Gould, C. Granell, M.A. Esbrí, G. Carrión	62
HOW TO MOVE FORWARD IN IMPLEMENTING SDIS WITH SOA? C. Cömert, H. Akıncı	63
PROVIDING WFD REPORTING OVER SDI SERVICES M. Á. Latre, R. Béjar, J. A. Álvarez, O. Castillo, P. R. Muro-Medrano	65
NATIONAL / REGIONAL SDI I	69
OUT SPIRE	70
S. Carlyle, M. Clark	
DEVELOPMENT OF A DANISH INFRASTRUCTURE FOR SPATIAL INFORMATION (DAISI GOALS AND MEANS) - 72
H. Brande-Lavridsen, B.H. Jensen REACHING OUT AND UNDER	74
I. Jackson	
EU-PROJECT: CROSS-BORDER SPATIAL INFORMATION SYSTEM WITH HIGH ADDED VALUE (CROSS- SIS)	77
J. Riecken GEOINFORMATICS AND GISCIENCE EDUCATION: UNIGIS AS SDI BRAINWARE	79
SESSION. DATA HARMONISATION	81
AN ONTO LOCK DATA HARIVIOLUGATION OF AN ADDRESS CATETTEED.	01
AN ONTOLOGY BASED APPROACH FOR THE CONSTRUCTION OF AN ADDRESS GAZETTEER. THE IDEZAR GAZETTEER USE-CASE	82
J. Nogueras-Iso, F. J. López, J. Lacasta, F. J. Zarazaga-Soria, P.R. Muro-Medrano FuroRoadS' contribution to the implementation of INSPRE	84
U.L. Sandgren	01
A NEW PRODUCTION PARADIGM BASED ON A SDI P Trevelyan, G Mallin, Jeremy Tandy	86
'FEATURE/OBJECT DATA MODELS' – A REPORT ON THE EUROSDR/EUROGEOGRAPHICS WORKSHOP	,
24-25 APRIL 2006 P. Woodsford A. Illert, K. Murrov, C. Portele, M. Seifert	87
DATA CERTIFICATION AND SPATIAL DATA QUALITY MANAGEMENT M. Sanderson	95

Table of Contents

SESSION: NATIONAL / REGIONAL SDI II	101
Lounaispaikka regional GI service and collaboration initiative Building a LSDI in South Western Finland	102
L. Nurmi, A. Vasanen Standards for data and metadata sharing in Italy: the SIGMA TER infrastructure G. Ciardi, P. Cipriano	105
Assessing the implementation of a X-border Spatial Data Infrastructure in the Euree Maas Rhine	gio 107
J.D. Bulens, J. Crompvoets, F.R. Kooij, L.A.E. Vullings, A. Ligtenberg SITAD: FROM A REGIONAL SDI TO A MODEL FOR DELIVERING CROSS-BORDER INFORMATION ON GEOGRAPHICAL DATA	110
L. Garretti, S.Griffa, R. Lucà	
SESSION: SDI IMPACTS	113
A ROAMING-ENABLED SDI (RSDI) OR THE RELATIONSHIP BETWEEN TECHNOLOGY AND MARKET PRESENCE	114
TRANSPARENCY OF ACCESSIBILITY TO GOVERNMENT-OWNED GEO-INFORMATION F. Welle Donker, B. van Loenen	116
MOTIIVE EXPERIENCES USING SIMULATION SOFTWARE TO ASSESS SDI COST-BENEFIT R.A. Longhorn	125
TOWARDS THE SOCIO-ECONOMIC ASSESSMENT OF SPATIAL DATA INFRASTRUCTURES M. Craglia, J. Nowak	127
SESSION: REGIONAL SDI	129
S. I. T. R. TERRITORIAL INFORMATION SYSTEM OF SARDINIA G.Pittau, R.Vinelli, M.Salvemini, L.Corvetto	130
HOW MUNICIPALITIES ARE JOINING REGIONAL SDI: FIRST RESULTS AND CONCLUSIONS	133
NAVARRA IN INSPIRE. INTEGRATION OF SDI AT REGIONAL (IDENA) AND LOCAL (IDEPAMPLONA) LEVEL	134
M. Cabello, P. Echamendi, M.A. Jiménez de Cisneros, A. Valentín REGIO-GEO.CH – INTER-REGIONAL SPATIAL DATA HUB WITH AUTOMATED DATA SHARING AND QUALITY CONTROL A. Bernath	136
SESSION: DATA SHARING	.137
Eliminating Obstacles at the Point of Use: Sharing Ordnance Survey Data among Public Authorities in Great Britain	138
C. Hadley, N. Sutherland INSPIRE AND INTELLECTUAL PROPERTY RIGHTS – A THUNDERSTORM OR A TEMPEST IN A TEAPOT?	139
DATA LENDING FACILITY – THE INNOVATIVE DOWNLOAD SERVICE OF THE FINNISH NSDI T. Toivonen, R. Kalliola & E. Ennola	141
AVAILABILITY OF GOVERNMENTAL GEO-INFORMATION, COMPLICATIONS IN PRACTICE H. Nobbe	144
SESSION: CLOSING PLENARY AND WRAP-UP	145
HOW TO KEEP REBUILDING A SDI ? – THE PORTUGUESE EXPERIENCE <i>R. P. Julião</i>	146 146

(Draft) 12th EC-GI&GIS Workshop: ESDI: From Inspiration to Implementation. Innsbruck, Austria, 21-23 June 2006. 2006.

12th EC GI & GIS Workshop, ESDI: from Inspiration to Implementation

147

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