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Plan4all

User Analysis Report

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[1] OJ L 79, 24.3.2005, p. 1.

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1. Introduction

1.1. Objectives

The main objective of Plan4all is not to develop and implement one common platform, but to define the rules for European spatial planning data interoperability. These rules have to be technologically independent and they will allow implementation of a solution based on either commercial or Open Source platforms. For the demonstration of feasibility of such a solution, there will be an implemented solution covering all pilot areas, that will be an effective combination of both Free and Open Source Software (FOSS) and commercial systems. The questions about the need for harmonisation of spatial planning documentation, experiences of technological and scientific partners with SDI for spatial planning, vertical and horizontal planning data interoperability and other questions cannot be answered without the involvement of users, who directly use spatial planning data in their everyday work.

Partners involved in the task 2.4 have elaborated more detailed analysis of user requirements through case-studies. The case studies' analysis includes data relating to metadata, data models, networking technologies. This additional data can be used for spatial modelling and for design of common models as an intersection of existing solutions.

This document summarises user requirements on planning system and places emphasis mainly on:

- Basic procedures and processes in spatial planning
- Spatial planning data
- Standards and regulatory framework
- Technical possibilities and alternative infrastructures
- Requirements on data and metadata models
- Used IPRs models
- User involvement in decision process and requirements by user groups

In addition to the case studies from the various countries, this report overviews for the individual countries: the spatial planning situation, available spatial planning data, infrastructure and rules. It provides a basis for the special analysis in WP 3, 4 and 5. The studies, that offer the description of planning systems in detail, are also available on the wiki project-site.

1.2. Background

The Plan4all project is focused on the following detailed spatial scales:

- **Regional Planning:** Regional planning is the task of settling the spatial or physical structure and development by drawing up regional plans as an integrated part of a formalized planning system of a state. Regional planning is required to specify the aims of spatial planning at an upper, overarching level. The regional level represents the vital link between a state-wide perspective on development and the concrete decisions on land uses taken at a local level within the land-use planning of the

municipalities. Its textual and cartographic determinations and information normally range in the scales of 1:50,000 to 1:100,000.

- **Local Land-use planning:** Local land-use planning is the creation of policies at a local/municipal level that guides the land and resource use inside the administrative borders of the municipality in charge of this task. Sometimes "urban planning" is used as a synonym. The main instrument of land-use planning is zoning or zoning ordinances, respectively. Land-use planning is situated below the regional planning level and consist normally of two stages: first a general or preparatory land-use plan (scale 1: 5,000 – 1: 50,000) for the whole municipality and second a detailed land-use plan for small part of it, mostly legally binding (scale 1: 500 – 1: 5,000).

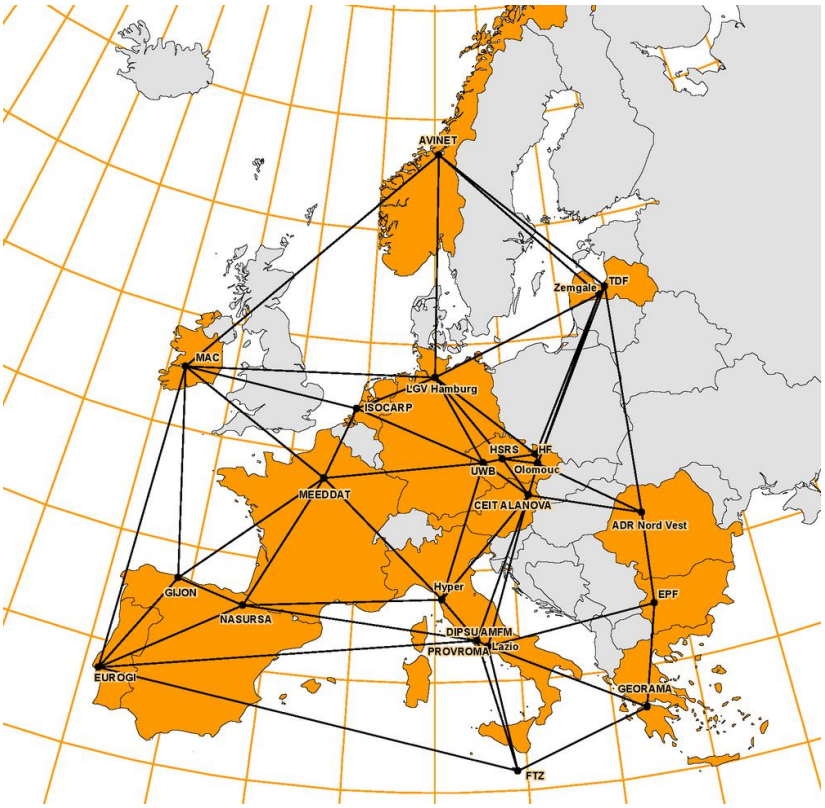

Figure 1: Dislocation of partners involved in the Plan4all project.

1.3. Report Overview

Comparison of the case studies as elaborated by the project members is the main part of this document.

Chapter 2 of this report represents analysis of spatial data planning, technology, digital rights management. The detail list of the spatial planning data is attached in Annex 1

Chapter 3 describes user requirements in three main sections – requirements overview, requirements according to group of users and important requirement in detail. Input forms of survey for requirements regarding user group are attached in Annex 2

Chapter 4 includes assessment, ideas and recommendations addressed to the other project workpackages.

Chapter 5 concludes the report.

To better understanding of the case study content, the structure of case studies is attached in Annex 3 of this report. This part also includes questions to be addressed in each case study.
Case studies are not included directly in this document, but they are available on the project website. The links to the case studies are included in references.

2. Case Studies Analyses

2.1. Procedures of the spatial planning in involved countries/regions

The following table summarises the formal steps for elaborating documentation; who executes and approves these formal steps, how public participation takes place and if there is formal scheme or detailed description of planning procedures in each case study.

In general, these procedures are commonly defined by spatial or building acts on national level and also in more detailed specified on regional level. Most important for municipality inhabitants are local plans whose procedures of elaboration are frequently mentioned.

Procedures of elaboration variety type of plans

Do formal steps for elaborating every plan exist?

Czech Republic	Italy	Italy	Bulgaria	Romania	Germany	Ireland
Olomouc	**ProvRoma**	Lazio	**EPF**	**NW RDA**	**LGW Hamburg**	**MAC**
strictly defined in Building Act and related legislation Remarks: Building Act sets down formal steps description and specific conditions for administrative processes in spatial planning. Formal processes are executed according to Administrative Act	The legislative and administrative competences lie within the regions - each region gives shape to its own planning systém through a corpus of laws. They define the institutional and juridical framework	The legislative and administrative competences lie within the regions - each region gives shape to its own planning systém through a corpus of laws. They define the institutional and juridical framework	The municipal and city general plans are following the procedure defined in the Spatial Planning Act	*Mandatory processes* in spatial planning in Romania are regulated by the national Law 350/2001	the procedure for preparing land use plans is laid down in Building Code The Federal Building Code is supplemented by the Plan Notation Ordinance and the Land Utilisation Ordinance. The Plan Notation Ordinance lays down the details for graphic representation and designation for urban land-use planning. The Land Utilisation Ordinance, which came into force in 1962, and which has since been amended several times (last time: 1990) to take account of current developments, enumerates general and specific categories of land use and sets rules for determining the intensity of built use, building method and design, and permissible lot coverage. This has standardised the urban land-use plans prepared by local authorities.	the planning and Development Regulations 2001 -set out the detailed procedural requirements to implements the Planning and Development Act 2000 Remarks: The Minister of the Environment, Heritage and Local Government has ultimate responisibility for environmental and planning legislation and plicy development

Greece	Spain	France	Spain	Norway	Latvia
GEORAMA	**NASURSA**	**MEDDAT**	**GIJÓN**	**AVINET**	**ZEMGALE/TDF**
Some formal steps for elaborating documentation are defined in L.2742/99	Formal steps are defined not at national level but at regional level (regional law 35/02 in case of Navarre).	Formal steps in elaborating plan are defined in the "code de l'urbanisme" but, acomplete view will be produced later as the law is rapidly evolving due to the current legislative process known as " engagement national pour l'environnement" resulting from the wide concertation process known as "Grenelle de l'environnement"	At national level no competences exist on spatial planning as such-transferred from central government to regional administrations and the local governments	The Planning and Building Act	The terms and processes are determined by Law on Territorial Planning, Cabinet of Ministers insures the development of long term concept: "Latvia's Growth Model: Putting People First" Remarks: Cabinet of Ministers insures also development of Latvia's Long Term Development Strategy. This document determines basic guidelines for national long term planning guidelines (priorities), as well prospective for spatial planning

Who executes and approves these formal steps?
National level:

Czech Republic	Italy	Italy	Bulgaria	Romania	Germany	Ireland
Olomouc	**ProvRoma**	Lazio	**EPF**	**NW RDA**	**LGW Hamburg**	**MAC**
Ministry of Regional Development procures planning documentation-Spatial Development Policy, that approves Government	superior level have the power to approve instrument and plans and to authorise intervention for lower levels	superior level have the power to approve instrument and plans and to authorise intervention for lower levels	The National and Regional Schemes are initiated by the Ministry of Regional Development and Public works and after the completion of their elaboration are approved by the Minister of Regional Development after expertise given by the National Expert Council for Spatial Planning and Regional development	by the below given documents it is detaoůed described in study National Plan for Territoral planning (PATN) (now in draft phase)	On federal spatial planning level there is no binding development plan provided for as a tool for controlling and developing the national territory as a whole. The Federal Ministry of Transport, Building and Urban Affairs establish a development plan for the exclusive economic zone beyond coastal waters (200 mile zone).	the approval and adoption of the National Spatial Strategy is the responsibility of the Government.

Greece	Spain	France	Spain	Norway	Latvia
GEORAMA	**NASURSA**	**MEDDAT**	**GIJÓN**	**AVINET**	**ZEMGALE/TDF**
The ompetent government body in the field of environmental and physical planning policy (the Ministry for the Environment, Physical Planning and Public Works, (YPEHODE) (renamed to Ministry of Environment 10/2009)	No competences exist on spatial planning at national level as such-transferred from central government to regional administrations	DTA It is a concerted process undertaken by a co-ordinating Prefect (state government representative) in close collaboration with the relevant local authorities, approved by the state through a state decree It only concerns a limited area of strategic importance	At national level no competences exist on spatial planning. The local and regional goverments approves the formal steps.	The Government shall develop and pass on national targets and regulations for planning in counties and municipalities and approve the regional planning strategies	The Cabinet of Ministers determines all level of planning documents, those content, terms of validation, approval, actualization, appellation possibilities, participation of society un that planning process, and terms of submitting of reviews of implementation of planning documents.

Who executes and approves these formal steps?
Regional level:

Czech Republic	Italy	Italy	Bulgaria	Romania	Germany	Ireland
Olomouc	**ProvRoma**	Lazio	**EPF**	**NW RDA**	**LGW Hamburg**	**MAC**
Regional office procures Spatial Development principles and Planning material, Regional assembly issues Spatial development principles and Regulatory plans	Legislative and administrateve competences are shared between the regional assembly, the regional President and the regional government, with administrative competencie. Regional plans are approved by the Region themselves.Provincial Territorial Plans are adopted by Provinical Concil and approved by Region	Legislative and administrateve competences are shred between the regional assembly, the regional President and the regional government, with administrative competencie. Regional plans are approved by the Region themselves.Provincial Territorial Plans are adopted by Provinical Concil and approved by Region	Not specified in case study	Zonal plan for Territorial Planning (PATZ), Regional Plan for Territorial Planning (PATR), Zonal plan for Territorial Planning (PATZ), County Plan for Territorial Planning (PATJ)	State spatial planning addresses spatial development in the state as a whole, while regional planning is concerned with subdivisions of a state. The function of state spatial plans (name differ from state to state like state development plan or. state development programme) is to coordinate the spatially relevant planning and projects of all competent organisational units and to tie them in with the conceptual aims of state spatial planning itself. Below the state level of spatial planning, regional planning is concerned with the detailed elaboration, sectoral integration, and implementation of the goals of state spatial planning. It accordingly mediates between state spatial planning and local urban land-use planning. Regional planning must conform with federal and state spatial planning.	Regional Authorities develop and approve regional planning strategies and plans

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GEORAMA	**NASURSA**	**MEDDAT**	**GIJÓN**	**AVINET**	**ZEMGALE/TDF**
Regional plans are approved by the Ministry of Environment and adopted by the Region themselves. Prefecture Territorial Plans are adopted by the Prefecture and approved by Region and the Ministry.	The Department of Spatial Planning elaborates regional spatial plans, approved by Regional Government.	SCOT- Local governments can propose to the Prefect the creation of a SCOT. A specific entity is then created (EPCI) that will be in charge of developing the SCOT. The management committee of the EPCI approves the SCOT and the prefect check its conformance to the law and validates the SCOT. SCOT are developed for specific part of the country where municipalities agree together to have a concerted approach to land planning. By 2017 all municipalities must be included in one and only one SCOT.	The Regional Government approve the spatial plans developed for the local administrations.	The County Council shall develop and approve regional planning strategies and County plans	All process of development and decision making process is the function of Council of Development of Planning Region. The project of regional plan and final version must been submitted in Ministry of Regional Development and Local Governments. All steps of development of that planning document are planned by local Municipal Council. Local Municipal Council makes final decision on approval of territorial plan in two weeks after submitting of final proposal of plan. The final proposal of plan must me submitted to specific Planning Region for official statement (report). After positive statement of specific Planning Region, local municipal Council performs approval of territorial plan of local municipality (town or province) and issuing of binding regulations (graphical part and textual description) as a main documentation for local land use and future development

Who executes and approves these formal steps?
Local level:

Czech Republic	Italy	Italy	Bulgaria	Romania	Germany	Ireland
Olomouc	**ProvRoma**	Lazio	**EPF**	**NW RDA**	**LGW Hamburg**	**MAC**
Planning office procures Local Plan, Regulatory plan and planning material, Municipal assembly decides about procurement of Local plan and Regulatroy plans, approves specifications for Local plan draft elaboration and issues Local plan and Regulatory plan	Municipal plans are adopted by the Municipal Council and approved by Region	Municipal plans are adopted by the Municipal Council and approved by Region	the Municipal council is making a decision for initiating a procedrure for elaboration of general plan and the mayor is obliged to manage the procedure.	General Urban Plan (PUG),Zonal Urban Plan (PUZ),Detailed Urban Plan (PUD),Municipal Plan for Territoral Planning (PATM)	the preparatory land-use plan requires the approval of the higher administrative authority	local authority(local palnning authorityś staff) are responsible for preparing the city or county´s statutory development plan. The City or County Manager has a role in preparing a numer of reports on allof the submissions received on the plan from member

Greece	Spain	France	Spain	Norway	Latvia
GEORAMA	**NASURSA**	**MEDDAT**	**GIJÓN**	**AVINET**	**ZEMGALE/TDF**
Municipal Territorial Plans are adopted by City Concil and approved by Region and the Ministry.	Municipal plans are adopted by the Municipal Council and approved by Region	PLU-Municipalities procures a PLU or a CC. The deliberation that is sent to the prefect, the presidents of the regional council and of the département council as well as other decision makers such as the president of the authority that organise public transport. The final version is approved by the municipal council. About 40% of the communes have no PLU or CC. The general provisions of the “code de l’urbanisme” apply	The municipal Council must develop a master plan for their territory. (Planes Generales de Ordenación)	The Municipal Council shall develop Municipal plans and Zoning plans	All steps of development of that planning document are planned by local Municipal Council. The final proposal of plan must me submitted to specific Planning Region for official statement (report). The copy of statement must be sent also to Ministry of Regional Development and Local Governments

Who is involved in the creation of plans?

Czech Republic	Italy	Italy	Bulgaria	Romania	Germany	Ireland
Olomouc	**ProvRoma**	Lazio	**EPF**	**NW RDA**	**LGW Hamburg**	**MAC**
planning materials are procured without public participation, Spatial development policy and planning documentation is procured with public participation. The role of public is different	according to mos regional laws on spatial planning more and more institutional and technical bodies relevant for the Municipal General Plan are involved in planning processes, (many regional laws foresee an institutional and participative process of plann	according to mos regional laws on spatial planning more and more institutional and technical bodies relevant for the Municipal General Plan are involved in planning processes, (many regional laws foresee an institutional and participative process of plan	Not specified in case study	Public utility, non-profit NGO with competences in Regional Development and Strategic Planning (established according to Law 151/1998)	two groups are defined in spatial planning legalisation that should be informed and should get the opportunity to participate and object in the proccess of land use planning – public agencies and public bodies and the public	Regional and Local Authorities after a period of public consultation.

Greece	Spain	France	Spain	Norway	Latvia
GEORAMA	**NASURSA**	**MEDDAT**	**GIJÓN**	**AVINET**	**ZEMGALE/TDF**
L.2742/99 on Spatial Planning and Sustainable Development and related regulations determines sets the general framework for territorial policies, specifying the purposes of public and private activities regarding territorial development	Regional Spatial Plans: consultants, all departments of the regional government, municipalities, development agencies, public participation. Local plans: consultants, municipal council, departments of spatial planning and environment, public participation	DTA: The local entities are associated as early as possible in the first phase. The second phase is based on a ministerial mandate and associates all the local governments. The later are oficially consulted and have to produce their advice, SCOT and PLU-all local actors, including the local state administration are associated to the process	To create plans are involved NGOs, agent social, firms, citizens (represented by neighborhood associations).	The Act gives all parties a chance to be heard when plans are being drawn up. The first chapters of the new planning part set out the distribution of tasks and responsibilities between the various public authorities, as well as the types of plans and the	The decison is made by local authority to elaborate the spatial plan and to establish the workgroup.The plan is elaborating together with all involved /interested stakeholders (state institutions, employers, NGO, local ingabitants) according to the laws. The resolution about the plan is made by Planning region.

How does public participation take place?

Czech Republic	Italy	Italy	Bulgaria	Romania	Germany	Ireland
Olomouc	**ProvRoma**	Lazio	**EPF**	**NW RDA**	**LGW Hamburg**	**MAC**
Most important for municipality inhabitants is the Local plan - citizens are authorized aktively taky a parti in procuring process-detailed descriped in case study	Citizens, according to the national law on spatial planning can make formal observations on plan choices and can propose possible limited and specific changes when the plans are already adopted by public administrations	Citizens, according to the national law on spatial planning can make formal observations on plan choices and can propose possible limited and specific changes when the plans are already adopted by public administrations	Not specified in case study	Law 350/2001 Section 6 regulates the involvement of citizens in the territorial planning process	The Federal Act on spatial planning (federal state / state / regional planning) and the Building Code (municipal level) defines formal public participation exactly	Development Plan - consultation (public must be consulted before the plan is adopted, Enforcement -Objections - individuals can notify thelocal authority about or také action through the courts against unauthorised development

Greece	Spain	France	Spain	Norway	Latvia
GEORAMA	**NASURSA**	**MEDDAT**	**GIJÓN**	**AVINET**	**ZEMGALE**
Today, these Frameworks have been completed and the immediate start of the process of public consultation and their enactment is expected	Regional legislations establish that both regional and local planning must hold public hearings for the citizens to present objections before approval. Duration depends on regions and instruments nature, ant it usually ranges from 20 days to 2 months. Regional legislations assure also the right for citizens to access planning information anytime, once approved. As additional information, CSPT is a participation entity defined by regional law 35/02 in case of Navarre. It is made up by social and economic agents, local entities, professional associations and sound experts in the subject. It recommends improvements to both planning legislation and regional but not local planning.	a public enquiry is mandatory and produces a report of the enquiry commission	Public participation is done in two stages in the development of General Plans. In a first phase (initial approval), by submitting proposals after the public exhibition. In the second phase, (provisional approval), by filing claims.	Not specified in case study	The public hearing of documentation of project consist of two steps. The first – starting of development (for submission of the suggestions), the second step – review of developed project.

Is the scheme (or detailed description) of plan procurement included into case study?

Czech Republic	Italy	Italy	Bulgaria	Romania	Germany	Ireland
Olomouc	**ProvRoma**	Lazio	**EPF**	**NW RDA**	**LGW Hamburg**	**MAC**
scheme of Local plan procurement	described Municipal plan process	described Municipal plan process	procedure of elaboration The municipal and city general (master) plans is described	not described	land-use planning procedure – detailed description	Not specified in case study

Greece	Spain	France	Spain	Norway	Latvia
GEORAMA	**NASURSA**	**MEDDAT**	**GIJÓN**	**AVINET**	**ZEMGALE/TDF**
Not specified in case study	Case study includes schema and detailed description for regional (Territorial Strategy of Navarra-ETN, Spatial Plans-POT, Territorial Action Master Plan-PDAT, Sector Plan or Project of Supra-Municipal Incidence -PSIS) and local planning (General Municipal Plans-PGM).	procedure of elaboration DTA, SCOT and PLU is described	Described Municipal plan process	processing zoning plans - widely descriped including schema	processing regional and local plans descriped

2.2. Processes in spatial planning

The following table indicates, if there are determined data sources in various States that have to be used for plans at different levels. No less profitable is to know if there exists information on plans' standardization. Case studies indicate that predetermined data sources and conditions for use of areas with different usage are (as described in the case studie)s in Czech Republic-Olomouc, Germany- Hamburg, Latvia Zemgale, Spain-Navara and Norway.

This is very important information for further work in Plan4all, as they have to follow detailed specification of the legal framework (in refered states) to determine which data should be collected and exposed in the planning procedure and their determination of conditions for use of areas with different manners of application.

Does framework exists?

	Czech Republic	Italy	Italy	Bulgaria	Romania	Germany	Ireland
Partner	Olomouc	ProvRoma	Lazio	EPF	NW RDA	LGW Hamburg	MAC
Does framework exists?	determined data sources, that can be used for plans on different levels. General specification is included in Decree 500/2006 coll., on Planning analytic materials (PAM), planning documentation, and planning activity filing. Data sources for PAM are specified in methodical materials issued by The Institue of Spatial Development	partly yes	partly	only for cadastre	only for cadastre	yes	yes - Irish National Spatial Strategy (ISDI)
on national level	yes	Regional Law 38/99 defines the legal framework for plans setup, but the rules are referred only to procedural and technical requirements focused on objectives and information to and not to data standard.	Not specified in case study	Not specified in case study	law on cadastre and land registration	Not specified in case study	The ISDI Policy Framework consultation document which covers ussues such as vision, basic principles, the spatial area to be covered by the ISDI, standards, legal, organisational, financial, consultation, research and development ..
on regional level	yes	The legislative and administrative competences for spatial planning lie within the regions, Regional Law 38/99 defines at article 17) SITR as main regional geographic systém	Not specified in case study	Not specified in case study	Not specified in case study	Not specified in case study	Yes each Regional Development Authority has developes a plan for its region.
local level	yes	Not specified in case study	Not specified in case study	Not specified in case study	Not specified in case study	Not specified in case study	Not specified in case study
remarks		territorial planning is practically non-existent on the national level,plans on the national level are not compulsory	at the moment, Regional Law 38/99 -legal framework for plans setup, but the rules are refered only to procedural and technical requirements focused on objectives an information to and not to data standard	according to Spatial Planning Act, the main provider for spatial data for planning purposes is the Geodsy Cartography and Cadastre Agency	the legal framework of spatial planning data collection contains laws on the regulation of the cadastre	An important prerequisite for the efficient and cost-effective implementation and operation of e-participation platforms is the usage of standards. This concerns the planning data itself as well as the methods to access these data.	NSDI is in the context of Irish e-government initiatives. It also states that spatial data are to be incorporated into other information management activities

Does framework exists?

	Greece	Spain	France	Spain	Norway	Latvia
Partner	GEORAMA	NASURSA	MEDDAT	GIJÓN	Avinet	ZPR/TDF
Does framework exists?	Minimal scope of collected data is also determined by legislative, but only in a very general form	Regional legislations set out general guidelines for municipal and regional planning.	In the French context the land planning code defines several categories of area regarding urban development. As local governments are free to manage themselves no technical framework is imposed to them	The Land Law of the Principality of Asturias, sets out guidelines for municipal planning	The Act is divided into a general- and a planning part. The general part includes also requirements to map data and spatial information, planning part-provisions detailing the contents of the various plans, the effects of the plans, and the procedures for dealing with them	At this moment in Latvia is worked out and attested "Geospatial information development concept of Latvia" (order No.718 on November 20, 2007 by Cabinet of Ministers)
on national level	L.2742/99 on Spatial Planning and Sustainable Development and related regulations determines the high level framework	No competences exist on spatial planning at national level as such-transferred from central government to regional administrations	Not specified in case study	At national level no competences exist on spatial planning	The Norwegian planning data standard is issued by the Ministry of the Environment through its sub-entity-is a part of the national spatial data standardization initiative, SOSI	In the concept is described geodesy and cartography as essence and mutual connection of geospatial infrastructure element
on regional level	Only partial and generic regulations exist	General indications of issues to be dealt with	The only framework to be used for SCOT is 1-general presentation 2-PADD (land planning sustainable development plan)	Not specified in case study	Not specified in case study	There exist now regional framework, for Zemgale planning region prepared from Norwegien funds, It define dala layers and legends. Local territorial plans and detail plans and determines local (municipal) possibilities for territorial development, restrictions of development - This documentation contains graphical supplements (images of maps) of current land use of local municipality, determined (allowed) land use of local municipality.
local level	Only partial and generic regulations exist. Town building acts exists only partially.	General indications of issues to be dealt with	The only framework to be used for PLU and CC is 1-general presentation 2-PADD (land planning sustainable development plan) 3-graphical annexes	The Municipal Action Plan (MAP), determines the framework in which encompass the General Management Plan	Planning and Building Act-municipality is the first instance which, through the planning process, shapes the physical environment and ensures that standards of construction and the application of conservation measures conform to local conditions and requirements	There exist now regional framework, for Zemgale planning region prepared from Norwegien funds, It define dala layers and legends. Local territorial plans and detail plans and determines local (municipal) possibilities for territorial development, restrictions of development - This documentation contains graphical supplements (images of maps) of current land use of local municipality, determined (allowed) land use of local municipality.

remarks	At the moment, the legal framework for plans is only general and is not specialized for every part of the country. There are rules for procedural and technical requirements focused on general objectives though not standardize throughout the country standard	The Department of Spatial Planning of Navarre is currently making Technical Planning Instructions (ITP), which aim at setting the conceptual and cartographic standards for municipal planning in Navarre			all municipalities are now required to conduct planning, to collect and maintain data in accordance with national data formats and standards and to keep a registry of their data holdings available for a national spatial data infrastructure	

Is input data described in case study?

	Czech Republic	**Italy**	**Italy**	**Bulgaria**	**Romania**	**Germany**	**Ireland**
Partner	Olomouc	ProvRoma	Lazio	EPF	NW RDA	LGW Hamburg	MAC
Is input data described in case study?	General specification is included in Decree 500/2006 coll., on Planning analytic materials, planning documentation, and planning activity filing. Data sources for Planning analytical materials are specified in methodical materials issued by The Institue of Spatial Development	partly	partly	partly	no	no	partly
map materials	yes	no	no	yes	no	no	no
thematic data from responsible providers	Planning analytic materials	SITR contains data and information finalized to the systematic asquaintance of the physical and associate-economic aspects of the territory, the territorial planning and the regional and local programming	Regional Law 38/99 defines at article 17) **SITR** as main regional geographic system	Yes	no	No	are descriped Irish datasets (which fall within the ambit of the themes set out in Annex I, II and III of the INSPIRE Directive) and responsible organisations
data from own surveys	Planning analytic materials	no	no	no	no	no	No
remarks			SITR contains data and information finalized to the systematic asquaintance of the physical and associate-economic aspects of the territory, the territorial planning and the regional and local programming				

Is input data described in case study?

	Greece	Spain	France	Spain	Norway	Latvia
Partner	GEORAMA	NASURSA	MEDDAT	GIJÓN	Avinet	ZPR/TDF
are input data described in case study	L.2742/99 on Spatial Planning and Sustainable Development and related regulations determines the high level framework. Recently Ministry of Environment has been established (10/2009).	partly	Partly	The data from the geodetic network and defined in the Laws	The Norwegian planning data standard is issued by the Ministry of the Environment through its sub-entity	Ministry of Defense as the responsible for implementation of state policy in sphere of geodesy, cartography and geospatial information together with holders of geospatial data will be responsible
map materials	Land Registry map, Hellenic military Geographical Service (HMGS) maps of Hellenic Republic,Technical maps or planimetric and altimetric survey	no	The cadastral maps registered with orthophotos and other topographic data	Topographic, cadastral, environmental, land uses, geological and orthophotos	yes	The proces is in definitiv. For Zemgale region curently exist smetgodology prepared from Norwegian funds. On national level it is planed next year
thematic data from responsible providers	no	list of environmental regulations with a clear spatial delimitation, and provides all teams in charge of the elaboration of a new Municipal Plan with a ***standard set of digital data layers***	No	Zoning Maps ZEPAS (Special Protection Areas for Birds) and LIC (Sites of Community Interest) and catalog protection of buildings and places of historical, artistic and mediambiental.	no	The process is in definite. For Zemgale region curently exist metgodology prepared from Norwegian funds. On national level iti s planed next year.
data from own surveys	Executive documents for the municipality and prefecture	no	no	no	no	no
remarks						

Output datasets described in case study

	Czech Republic	Italy	Italy	Bulgaria	Romania	Germany	Ireland
Partner	Olomouc	ProvRoma	Lazio	EPF	NW RDA	LGW Hamburg	MAC
otput datasets described in case study	yes	Partly	Partly	no	no	yes	No
national level	Spatial development policy	no	no	no	no	federal - Plan Notation Ordinance(graphic representation), Land Utilisation Ordinance, With the adaptation of EU guidelines from 24.6.2004 in the German federal town planning law (BauGB, Section 4a, (4)) it is now possible to use e-information technologies for public participation in urban planning	no
regional levl	Spatial development principles,Content of spatial development principles is specified in Decree No. 500/2006 Coll. Appendix no.4	Each region gives shape to its own planning system through a corpus of laws. They define also competences, contents and procedures,	The Regional Landscape Plan (PTPG - Piano Paesistico Regionale Generale), that is going to be approved, is the first plan which aims to face landscape with a unifying, systematic purpose	no	no	no	no
local level	Content of local plan is specified in Decree No. 500/2006 Coll. Appendix no.7, determination of conditions for use of areas with different usage manner, that are specified in Ministry decree No. 501/2006	no	General Municipal Plan, The plan is based on the concept of zoning and allocates particular uses and characteristics to all areas of the land it covers. It indicates land-use at a general level and defines land-use for the whole area of the municipality	no	no	preparatory land-use plan, binding land-use plan (thecontent of preparatory and binding land-use plans is governed by section 5 and 9 of the Building Code	no
remarks			PTPG - There is also an explicit reference to European documents (as ESPD and Landscape Convention), and to methods recognized at national and European level (Corine Land Cover), so that the Landscape Plan could be compared with other fundamental cartographies and be useful for other planning levels (land use planning, town planning, etc.).			In accordance to secton 5 of the Federal Building Fcode there are several possible representations within a preparatory land-use plan (desriped in case study), the Federal Building Code provides with sections 9 a catalogue of possible designations for a legally - binding land-use plan (desriped in casy study)	

Output datasets described in case study

	Greece	**Spain**	**France**	Spain	Norway	**Latvia**
Partner	GEORAMA	NASURSA	MEDDAT	GIJÓN	Avinet	ZPR/TDF
otput datasets described in case study	L.2742/99 on Spatial Planning and Sustainable Development and related regulations determines the high level framework. Recently Ministry of Environment has been established (10/2009).	Output data as stated in draft of Technical Planning Instructions under elaboration, is shown in case study (9 harmonized layers).	Partly	Partly	More comprehensive description on the Zoning plan is presented in section 1.3.3.	Partly
national level	no	No.	no	no	no	Yes
regional levl	no	Yes. Regional Spatial Plans are currently in elaboration, approval is foreseen in 2010.	no	no	no	no
local level	no	Yes. The Department of Spatial Planning of Navarre is currently making Technical Planning Instructions (ITP), which aim at setting the conceptual and cartographic standards for municipal planning in Navarre.	The zoning map that allow to refer the regulation part to locations, the public utility constraints (SUP) that restrict the possibility to build in given area	Plan General de Ordenación. Cartografía de planeamiento y Ordenanzas y Normas de aplicación	More description on the Municipal master plan i in section 1.3.2 .The zoning plan-more description in 1.3.3. Currently, there are 207 land-use objectiven in the Norwegian standard	no
remarks	Recently Ministry of Environment has been established (10/2009). Updates will be announced	no	The digitisation of the local spatial planning documents (PLU) and the public utility constraints (n as SUP and the associated application GeoSUP) being in progress, datasets will be described later	no	no	no

Types of legal framework

The description below introduces current legal framework mentioned in the Case Studies to determine which data should be collected and exposed in the planning procedure. The specification of the data determins conditions for areas utilization with different usage patterns.

OLOMOUC

In the planning process there are predetermined data sources, that can be used for plans on different levels. General specification is included in Decree 500/2006 coll., on Planning analytic materials (PAM), planning documentation, and planning activity filing. Data sources for PAM are specified in methodical materials issued by The Institue of Spatial Development (ÚUR)

Thematic data

Thematic materials:

- Limitation of the area use due to protection of public priorities (according to legislative)
    - for spatial planning these limitations are collected as part of PAM on the basis of data provided from responsible institutions
- Area values (natural, landscape, urban values)
    - data is collected from land survey for purpose of planning analytical material elaborating
- Programmes for executing the changes in the area
    - received from valid planning documentation – in generalised form in PAM
- Data from planning studies – if it is valuable to use it (content of planning studies is not standardized)
- Planning documentation data – data from other planning documentation (neighbourhood municipalities area, planning documentation on higher level etc.)

Spatial development policy

Data exposed in the planning procedure:
Spatial development policy:
Contains spatial data:

- Development areas and development axes
- Areas with specific values and specific problems
- Areas and corridors of the transport and technical infrastructure of national or international importance

Spatial development principles

Spatial development principles:
Sets general conditions and requirements for purposeful and economic arrangement of the region's territory.
Content of spatial development principles is specified in Decree No. 500/2006 Coll. Appendix no.4
Text part contains region development concept specifying the fundamental requirements for the region's reasonable and economic layout

Graphic part contains:

- Detailed delimitation of development areas and axes from policy
- Detailed delimitation of the areas with specific values and specific problems
- Areas and corridors with super-local importance (including area system of ecological stability – ecological networks)
- Public works, measures, reclamations and demolitions of super-local importance
- Localities, areas, and corridors of super-local importance where the verification of changes in their use is required by a study, or the procurement and issue of a regulatory plan is required

Local plan

The Local plan determines the basic concept of the development of the municipality, protection of its values, its areal and spatial arrangement, arrangement of the landscape, and the concept of the public infrastructure. Content of local plan is specified in Decree No. 500/2006 Coll. Appendix no.7

Text part of local plans includes concepts:

- Development concept of a municipality area, protection and development of its values
- Urban planning concept, including delimitation of areas with development potential, areas for reconstruction, and green spaces sharing system
- Concept of public infrastructure, including conditions for its installation
- Concept of landscape layout, including delimitation of areas and determining conditions for changes in their use, area system of ecological stability, landscape penetrability, erosion protection measures, flood protection, leisure time activities, raw materials mining etc.
- Determination of conditions for use of areas with different usage manner that are specified in Ministry decree No. 501/2006. Determined are next types of areas with different usage manners, covering whole area of area concerned, which should be classified in more detail:
    - Residental areas
    - Leisure time activities areas
    - Public services areas
    - Public spaces areas
    - Mixed residential areas
    - Transport infrastructure areas
    - Technical infrastructure areas
    - Manufacture and warehousing areas
    - Combined manufacture areas
    - Aquatic and water resources areas
    - Agriculture areas
    - Forest areas
    - Natural areas
    - Combined undeveloped areas
    - Minerals mining areas
    - Specific areas

In these areas is determined the prevailing usage manner (major use), if possible to determine, admissible use, inadmissible use, or conditional admissible use of these areas and specification of space layout conditions, including fundamental conditions for protection of landscape character (e.g. height limits for buildings, use intensity of plots within areas).

Germany - HAMBURG

The most important local planning instruments are the preparatory land-use plan and the binding land-use plan. The preparatory land-use plan is prepared for the entire municipal territory. It outlines the use to which land is to be put to meet the foreseeable needs of the community in keeping with the spatial planning and development goals of the municipality. This is the plan's particular role in urban development. Section 5 of the Federal Building Code regulates its content. The binding land-use plan is drawn up for a section of the municipal territory. It must be developed on the basis of the preparatory land-use plan (Section 8 (2) of the Federal Building Code). The binding land-use plan sets out the legally binding stipulations for urban structure (Section 8 (2) sentence 1 of the Federal Building Code). On the basis of the Building Code, local authorities can adopt binding land-use plans in the form of bye-laws. The content of preparatory and binding land-use plans is governed by Sections 5 and 9 of the Building Code. In accordance to Section 5 (2) of the Federal Building Code there are several possible representations within a preparatory land-use plan, e. g.

- Areas designated for development in terms of general types of use (e.g. residential, mixed, industrial and commercial, special uses), specific types of use and the general density of built use
- Areas for transport
- Areas and facilities for public infrastructure
- Areas for utilities
- Areas for green spaces,
- Agricultural land and woodland
- Waterbodies, ports and harbours, as well as areas for water management, flood control and drainage
- Areas for measures for the protection, preservation and development of the natural environment and the landscape

The Federal Building Code provides in Section 9 (1) a catalogue of possible designations for a legally-binding land-use plan. The section refers in particular to

- Specific category (e.g. small residential estate area, residential-only area, general residential areas, special residential areas, village areas, mixed areas, centre area, commercial areas, industrial areas, special areas) and intensity of built use (e.g. occupancy index, plot coverage rate, floor space index, floor area, cubing ration, building volume)
- Type of development, lot coverage, and positioning of physical structures
- The coverage type, plot areas which may or may not to be built on and the location of physical structures
- Traffic areas and special purpose traffic areas
- Designations relating to common facilities and public infrastructure
- Designations on green areas and open space areas and relating to conservation
- Waterbodies
- Agricultural and forest areas
- Planting and care of trees

Spain - GIJÓN

The General Management Plan of Gijón was adopted on 11 December 2006 and its consolidated text was published on June 6, 2007.
This planning consists of 6 volumes of the implementing legislation and 135 planes at different scales (1:1000, 1:2000, 1:4000 and 1:20000)

- Volume 1: Report of Analysis
- Volume 2: Memory Management
- Volumes 3, 4 and 5: Urban regulations
- Volume 6: Financial and Economic Survey
- Volume 7: We are still working: Catalog protection of buildings and places of historical, artistic and environmental

The characteristics of cartographic representation are:

- Designation of Soil Classification (Urban land, building land and undeveloped land)
- Designation of land valuations
- Designation of rural as well as all areas with some protection (landscape, forest, agricultural, archaeological, etc...)
- Definition of Basic Infrastructure, Communications and Services
- Designation of public facilities, social, sporting, welfare, educational, recreational, religious, and cultural health
- Designation of other planning figures: Units of Action, Special Plans, Construction Projects, Concerted Action Areas and Specific Management Areas

Spain - NAVARRA

Regional plans are being elaborated for the first time, and approval is foreseen in 2010. The plans are currently in public consultation. All 5 subregions of Navarra are being dealt with at the same time, aiming at some standardization of procedures and content. In the case study, an extensive list is mentioned of all the maps that have been produced
Regarding the ***municipal planning maps***, they must be confined to some categories which are established by law. The Department of Spatial Planning is currently making Technical Planning Instructions (ITP), which aim at setting some ***conceptual and cartographic standards for Municipal Planning***. The elaboration of these instructions is still under way, and expected to finish in 2009.

A concept version of the instructions has incorporated nine maps, reflecting planning categories which in some cases are well defined by the law (like land classification), but in other cases are less unambiguously established (like the land use catalogues). We describe every map and its characteristics.

- Scope. Includes the site or sites delimiting the geographical scope affected by the planning instrument.
- Spatial Sectors. Include the sites delimiting, according to the legal definition of Article 50 of the LFOTU, "the spatial units of significant size for purposes of analysis and structuring land development."
- Classification. Refers to the sites delimiting the different Land Types established by the Municipal Land Development Plan: Urban Land, Developable Land and Non-developable Land.

- Categorisation. Refers to the sites delimiting the different categories and subcategories of Urban, Developable and Non-developable Land indicated in arts. 92.2, 95.2 and 94.2; 94.3 LFOTU 35/200.
- Sectoring. Includes sites delimiting the different sectors and scopes in which the instrument divides developable land and if relevant, non-consolidated urban land.
- Distribution Areas. Refer to the delimiting of distribution areas which the planning instrument has established according to that set forth in Art. 101.1 and 101.2 of the LFOTU.
- Performance Units. Include delimitation of the performance units foreseen in article 142 of the LFOTU established by the planning instrument.
- Allowances and Services. Refer to the sites or other graphic items delimiting or defining the allowance and service spaces (general and local systems) indicated in article 53 of the LFOTU and regulations completing or developing it.
- Catalogues of Use. Include the sites delimiting the different purposes or uses foreseen by the planning instrument for urban or developable land, including the general systems. For such a purpose, this layer will use as reference spatial sites on developable and non-consolidated urban land, those defined in the sector and scope layers, performance units and general and local systems. In the consolidated urban land, together with the general and local system layer, the plan will use its own sites such that they produce a true and accurate image of the global uses for the territory.

It is expected that these instructions will get a formal character, applying at least to all new plans being made in the future. Moreover, the Department hopes to engage in a process to translate all the existing plans to these nine maps, independently of the Planning Act to which they correspond.

The instructions do not reach a high level of detail, in order to avoid large bureaucratic procedures and inflexibility for new plans, and to enable the adaptation of plans under different Planning Acts in time.

This high degree of detail has indeed been reached by a document which set extensive standards for every detail of an urbanistic plan, elaborated in 2000.

NORWAY - AVINET

The Norwegian planning data standard is issued by the Ministry of the Environment through its sub-entity. Statens Kartverk (Norwegian National Mapping Authority). The standard was created and is being evolved in close cooperation with stakeholders through standardization working groups, chiefly Plandataforum (eng: “Planning Data Forum”).

The Norwegian planning data standard is a part of the national spatial data standardization initiative, SOSI – an abbreviation which roughly translated means “Joint System for Spatial Information”.

The data model is a simple model consisting of an entity set corresponding to legal land-use categories and purposes defined in the Norwegian Planning and Building Act (new/updated law in effect from July this year: “Plan- og Bygningsloven av 1. Juli 2009”). This law

includes a new planning section in accordance with a proposition from the Norwegian Odelsting (nr. 32 2007-2008).

The new law states that all municipalities are obliged to keep a planning registry and defines the content of this registry to be the spatial planning map. As such, all municipalities are now required to conduct planning, to collect and maintain data in accordance with national data formats and standards and to keep a registry of their data holdings available for a national spatial data infrastructure.

The standard is very much geared towards accurate graphical reproduction of planning maps in accordance with the national standard for how such maps should look. Until the present time, a variety of practices have been in existence among local and regional planning authorities since only the graphical part of the output had to comply with the standard.

The standard as a consequence is not geared towards sophisticated e-government services and other forms of digital re-use of the planning data.

Latvia Zemgale

Regarding the ***local planning maps***, they must confine to some categories which are established by law. The Ministty of Regional and Local Government is currently making Technical Planning Instructions (ITP), which aim at setting some ***conceptual and cartographic standards for Municipal Planning***. The elaboration of these instructions is still under way, and expected to finish at the beginning of 2010.
The data, which must be shown in the graphical part of the spatial plans, is defined in the Latvian Rules of Ministers No.883 (Article No.24):

- 24.1.topographical map (plan), which is used for preparation of the local authority spatial plans;
- 24.2. map (plan), which shows existing/current use of the territory;
- 24.3.map (plan), which shows the planned (permitted) use of the territory, by defining:
    - 24.3.1.location of planned magisterial engineer-technical communications and traffic infrastructure
    - 24.3.2.protective zone and territories of risks, which description is possible in the chosen map (plan) scale;
    - 24.3.3.territories, where detailed plans should be developed
- 24.4.other maps (plans), which are necessary for displaying separated type of use and restrictions of use by indicating the border of the administrative territory.

Methodological guidelines for the territorial development planning have been worked out for Zemgale Planning Region and its local municipalities within the framework of the project "Raising the institutional capacity of Zemgale region local governments for promotion of the economical activities in cooperation with the Norwegian institutions" that was financed by the bilateral financial instrument of the Norwegian government (cooperation agreement Nr.LV0056):

- Analysis of the existing situation – overview about the actual normative acts that regulate
- Elaboration of the development planning documents, analysis of the existing planning instruments and indicators, planning practice and experience evaluation of Zemgale planning region

- Terms developed for the contents (also for the cartographical material and nomenclature) of the territorial development planning documents
- Guidelines developed for the elaboration and approval procedures of the territorial development planning documents, as well as for public involvement in the planning process, including the samples of the documents (also overviews about the planning process)
- Guidelines defined for the monitoring system of the territorial development planning documents and the indicator system to analysis the results of the planning document's implementation
- Proposals prepared for development of the data-base for the territorial plans

2.3. Characteristics of Spatial Planning Data

2.3.1. Data format

The process of digital elaboration of spatial plans is very important for the next steps of data exploitation. Spatial plans are mainly official documents, and analogue forms of these documents are often legally binding. It means that spatial plans are drafted only to "look well" in their printed version and conversion to GIS systems results in many problems especially with topology. Data formats used by project partners – data providers should give an objective view on practises used in digital elaboration of spatial plans.

Table 1: Data formats used in spatial planning by project partners – content providers

Partner	Vector data formats	Raster data formats	Database:	Remarks
Olomouc	DGN, DWG, SHP	TIFF, JPEG, PDF		
PROVROMA		ECW, GeoTIFF	Oracle Spatial 10g SDO-Geometry	
Lazio	DWG, DXF, SHP	TIFF		is going to adopt GML within 2012
EPF	CAD4,ZEM, DXF, DWG, SHP		MDB	
ADR Nord Vest	DWG, DXF, DGN SHP			
LGW Hamburg	DWG, SHP, SVG, GML	GIF, PNG, BMP, JPEG, TIFF	ArcSDEon Oracle/Oracle spatial, PostgreSQL/PostGIS	Using GML based exchange format
MAC	MWF, PMF, DWG,DXF, SHP	ArcInfo-GRID, IMG, TIFF, BMP, JPEG, PCX		
TDF	SHP, DGN, DWG, DXF	JPEG, Tiff	PostgreSQL/PostGIS	Support for WMS, WFS, CSW
ZPR	SHP, DGN, DWG, DXF	JPEG, PDF, Tiff	MS SQL 2008, PostgreSQL/PostGIS	Support for WMS, WFS, CSW
FTZ				Data formats used not mentioned in case study
GEORAMA	DGN, DWG, SHP	TIFF, JPEG, PDF		
NASURSA	DGN, SHP	LIB, PDF	Arc-SDE, SQL Server	PDF: for written documents about Planning Instruments
GIJON	DGN, SIG, SHP	PDF	ORACLE, MS.ACCESS	
MEEDDAT				Data accessible via WMS services, no other data format mentioned in Case study
AVINET				

As presented in Table 1, planning data are often produced in CAD formats like Bentley's DGN or Autodesk's DWG. The most used GIS data file format is ESRI shapefile. Lack of topology could be a problem in using data for further analysis.

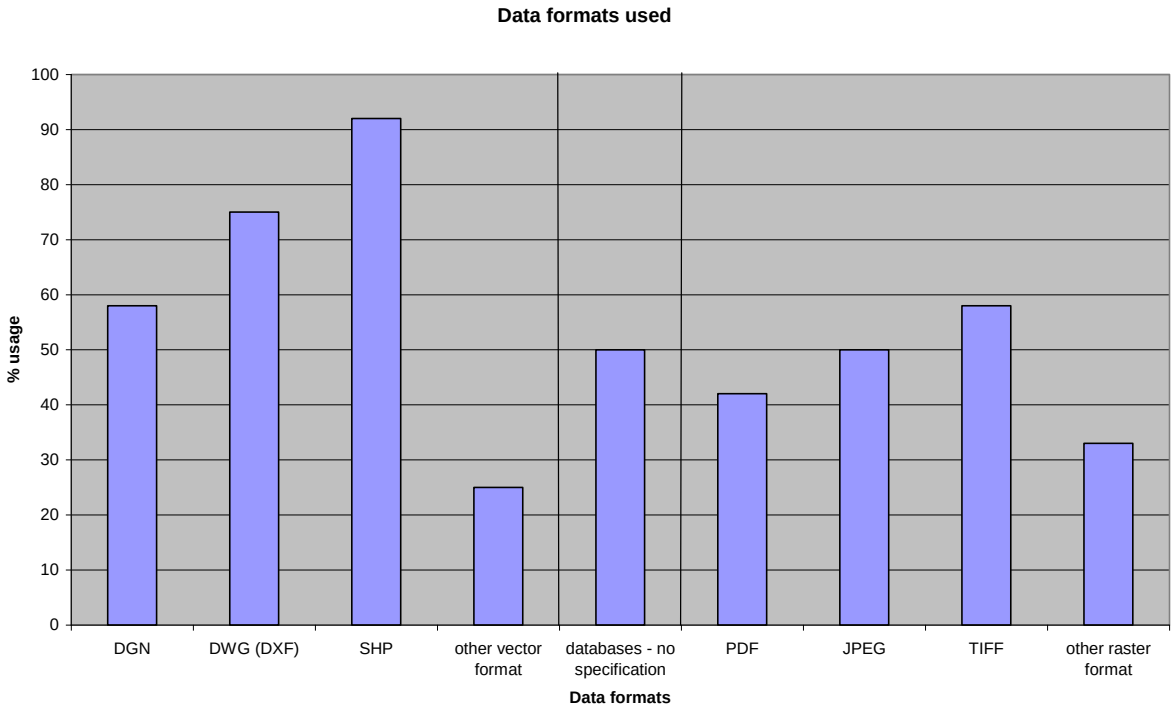


Figure 2: Data format used

2.3.2. Quantity and Quality of Content

All content providers were asked to evaluate in their case study the updated table of data content, based on the updated version of the table from chapter 4.1 of the Description of Work. This updated table is included in ANNEX 1 of this deliverable.

2.4. Data standards and data models

This part of the case studies was focused on data standards and data models used by project partners as input for Analysis that will be take place in Task 4.1. Partners were asked to describe spatial planning processes using standardized data models (if there are standardized models used), and it's obligation of use for spatial plans elaboration.

Table 2: Quick overview of spatial planning data models use by project partners.

Partner	mandatory	recommended	in progress	no models	remarks
Olomouc		✔			Data model described for ESRI technologies and CAD formats.
PROVROMA			✔		Standardization in progress on national level
Lazio			✔		Standardization in progress on national level
EPF				✔	data models only for cadastral data
ADR Nord Vest				✔	some municipalities use own data models

LGW Hamburg		✔			GML based data exchange model on national level
MAC					Case study focused on coordinate systems used in Ireland and quality of data
ZPR			✔		Data model described for ESRI technologies for Zemgale Region municipalities
FTZ				✔	No standardized models used
GEORAMA				✔	Data standardization planned for future
NASURSA			✔		Standardized system in development for municipal planning but not for regional planning.
GIJON				✔	No standardized models used
MEEDDAT			✔		Data standard coherent with national standards - in approval process
AVINET	✔				Simple model issued by the Ministry of Environment corresponding with Building Act requirements for land- use categories.

Situation in data models exploitation by project partners:

Olomouc

At our level, there is the recommended HKH (T-maps) data model for spatial planning. So far, there is a separate data model for PAM and Spatial Planning Documentation, although they are mutually compatible and they will certainly be united in the Olomouc region. The regional authority initiates the usage.
Older documentation and often also the current documentation have their own data models dependent on a compiler to a certain extent. Regarding the fact that current legislation adjustment is valid from January 1, 2007 and currently there is a transition period allowing adjustment of older documentation so it is in conformity with the valid legislation, it is necessary to establish clear bonds between the standard for delimitation of areas with different way of usage according to the Act no. 500/2006 Coll. and categories used in older documentation.
Data models or their usage is only recommended. No obligation to process planning documentation in a digital way exists.

ProvRoma

Nowadays, the Province of Rome doesn't adopt any standards for its Planning process, nor any data pattern. The Committee for technical rules on spatial data of CNIPA (National Committee for Information Technology in Public Administration) has obtained results, in evaluation now.
The documents produced are based on the INSPIRE Directive, for their possible application. However, to establish a system of shared rules, it is important that they are made as binding as possible.

Lazio

Currently, Lazio Region does not use specific standards for the management of its own territorial information; Regional Law 38/1999 only establishes to use the regional technical paper for plan production.
The National Committee for the Technical Rules on Territorial Data (CNIPA) is working to drawing up rules and lines guide to apply in this field.
In future, the utilisation of these rules will be compulsory for law at national level, at the moment these rules are only recommendations not formalized. Lazio region has already adopted such detailed lists, since they appear sufficiently stable and consolidated. For to Lazio Region SITR will setup the guidelines for territorial data management.

LGV Hamburg

For the exchange of digital planning data, as well as for the internet-based provision of planning data to potential users, a data exchange format need to be supported by all IT-systems in use without the necessity of complicated conversions, and being able to represent every possible spatial plan without loss of information. Existing exchange CAD formats like Autodesk DWG / DXF cannot be used for this purpose, because they mainly describe the graphical representation, and not the semantically content of a plan. A semantically enriched data model, describing the geometrical and logical content of a spatial plan independent from its graphical representation, and an object oriented data exchange format supporting this model are missing. For this reason a semantic data model (XPlanung) and a neutral exchange format (XPlanGML) for urban planning data is beeing developed since 2003. XPlanung belongs to Germany's national eGovernment strategy pursued by the federal government, federal-state governments and municipal administrations "Deutschland-Online". XPlanung is part of the "Deutschland-Online Project Geographic Data". Lead management for this project has the federal state of North-Rhine Westphalia (GEObasis.nrw). XPlanung is also part of SDI Germany.

The central goals of XPlanung are to enhance interoperability of the IT-systems used for urban planning and to enable evaluations like, e.g., checking of building applications, providing to use e-information technologies for public participation in urban, landscape and spatial planning or monitoring of the plan implementation. The developed standard XPlanGML relies on the international standard GML-3. XPlanGML formalizes all legal regulations relevant for urban planning. Corresponding to German planning law XPlanung standardised data models and data-exchange format (XPlanGML) for:

- Comprehensive regional planning at federal, federal state and county level (based on framework law "Federal Spatial Planning Act")
- Preparatory land-use plan, binding land-use plan, project and infrastructure plan (based on "Federal Building Code")
- Landscape programmes, landscape master plans, landscape plans (based on framework law "Federal Nature Conservation Act")

XPlanGML was evaluated in a model project of the SDI Germany (GDI-DE).

The standard XPlanGML represents the planned urban development from a juridical point of view. XPlanGML objects have a two dimensional geometrical representation. The XPlanGML objects and their corresponding attributes represent legal restrictions and

regulations. Restrictions may be formulated geometrically (e.g. specification of the area where buildings are allowed or forbidden) and/or attributive (e.g. specification of a maximal height, number of storeys or occupancy index of a building). If a specific regulation cannot be formalized by a set of attributes, an integration into the XPlanGML data model as free text is possible. Optionally, this text can be related to specific parts of the planning area.

The use of XPlanGML for exchanging spatial data is just a recommendation, using XPlanGML is not regulated by law.

NASURSA

The Service of Zoning and Urban Planning of the Government of Navarra is developing a standardised Information System with the aim to facilitate access, query and dissemination to the Territorial and Urban information. The final implementation will be defined after coming into force of the Planning Technical Instructions which will establish the requirements for municipal planning information elaboration and delivery.

The new regulation organises the information according to the next structure in layers:

- Scope. Includes the site or sites delimiting the geographical scope affected by the planning instrument.
- Spatial Area. Include the sites delimiting, according to the legal definition of Article 50 of the LFOTU, "the spatial units of significant size for purposes of analysis and structuring land development."
- Classification. Refers to the sites delimiting the different Land Types established by the Municipal Land Development Plan: Urban Land, Developable Land and Non-developable Land.
- Categorization. Refers to the sites delimiting the different categories and subcategories of Urban, Developable and Non-developable Land indicated in arts. 92.2, 95.2 and 94.2; 94.3 LFOTU 35/200.
- Sector. Includes sites delimiting the different sectors and scopes in which the instrument divides developable land and if relevant, non-consolidated urban land.
- Distribution Areas. Refer to the delimiting of distribution areas which the planning instrument has established according to that set forth in Art. 101.1 and 101.2 of the LFOTU.
- Execution Units. Include delimitation of the execution units foreseen in article 142 of the LFOTU established by the planning instrument.
- Resources and Services. Refer to the sites or other graphic items delimiting or efining the resources and service spaces (general and local systems) indicated in article 53 of the LFOTU and regulations completing or developing it.
- Global Uses. Include the sites delimiting the different purposes or uses foreseen by the planning instrument for urban or developable land, including the general systems. For such a purpose, this layer will use as reference spatial sites on developable and non-consolidated urban land, those defined in the sector and scope layers, performance units and general and local systems. In the consolidated urban land, together with the general and local system layer, the plan will use its own sites such that they produce a true and accurate image of the global uses for the territory.

AVINET

The Norwegian planning data standard is issued by the Ministry of the Environment through its sub-entity. Statens Kartverk (Norwegian National Mapping Authority). The standard was created and is being evolved in close cooperation with stakeholders through standardization working groups, chiefly Plandataforum (eng: "Planning Data Forum").

The Norwegian planning data standard is part of the national spatial data standardization initiative, SOSI – an abbreviation which roughly translated means "Joint System for Spatial Information".

The data model is a simple model consisting of an entity set corresponding to legal land-use categories and purposes defined in the Norwegian Planning and Building Act (new/updated law in effect from July this year: "Plan- og Bygningsloven av 1. Juli 2009"). This law has been equipped with a new planning section in accordance with a proposition from the Norwegian Odelsting (nr. 32 2007-2008).

The new law states that all municipalities are obliged to keep a planning registry and defines the content of this registry to be the spatial planning map. As such, all municipalities are now required to conduct planning, to collect and maintain data in accordance with national data formats and standards and to keep a registry of their data holdings available for a national spatial data infrastructure.

The standard is very much geared towards accurate graphical reproduction of planning maps in accordance with the national standard for how such maps should look. Until the present time, a variety of practices have been in existence among local and regional planning authorities since only the graphical part of the output had to comply with the standard.

The standard as a consequence is not geared towards sophisticated e-government services and other forms of digital re-use of the planning data.

MEEDDM (MEEDDAT)

The data model and standards used in the GeoADS, GeoSUP and PUL&CC digitization project will be as follows.

- Orthophotos and cadastral maps are accessible via WMS servers using the MEEDDM SDI (Cartelie)
- Data standard and models for PLU&CC, are coherent with the standards defined by the national council for geographic information (CNIG) accessible at http://www.geomatique-aln.fr/rubrique.php3?id_rubrique=43. It is under revision, its final version will be available end 2009. The initiator is the CNIG in agreement with the MEEDDM.
- Data standard and models For SUP, aret defined by the in-house application geoSUP accessible at http://www.geomatique-aln.fr/rubrique.php3?id_rubrique=161

ZEMGALE

Norwegian fund portal will include: Topography, Ortophoto and Cadastre data (as input layers) and at least 11 spatial plans of local authorities, it will be available for internal use of

planning specialists. Due to symbols and colours will be defined as Latvian Rules of Ministers (hopefully in beginning of 2010), then the Norwegian fund portal will be updated and only input of local spatial plans will started afterwards.
Web service will be available for public on industrial territories of Zemgale region
http://www.zemgale.lv/index.php?option=com_docman&task=cat_view&gid=57&Itemid=135

2.5. SW facility

One of the important objectives in the Plan4all project is the WP6 Large scale testbed. The State of SW facility of project partners and content providers is an indispensable foundation for proviing tests in WP6. It gives a basic overview of technology problems with data provision to be solved when WP6 will start.

Table3: Overview of SW used by project partners – content providers

Partner	SW used
Olomouc	MicroStation, ArcGIS - ArcView 9.3, Janitor
PROVROMA	MapInfo 9.5, ArcView 9.2, ERDAS Imagine,ERMAPPER 7.1, ENVI 4.5, IDRISI 16.1
Lazio	ArcGIS - ArcView, ArcInfo 9.3; ArcIMS 4.0, PLANETEK (Image Web server), Cart@net, AutoCAD Map 2009
EPF	ESRI, Autodesk, Map Info
ADR Nord Vest	AutoCAD 2006, eTerra, Generate CP, GPS Spider, ArcGIS, SivGIS, MicroStation, LpisWeb
LGW Hamburg	ArcGis 9.3, AutoCAD Map 2009, MicroStation, ArcIMS 9.2/9.3, Autodesk MapGuide
MAC	MapGuide, GeoMedia, ESRI products
ZPR	ArcGIS 9.3, AutoCAD Map 2009, MicroStation, MS SQL 2008, Geoportal (including Micka, MapMan, Dataman, Metadata extractor, Catalogue Services)
TDF	Geoportal (including Micka, MapMan, Dataman, Metadata extractor, Catalogue Services)
FTZ	Type of gis server used by MEPA not specified in case study
GEORAMA	ArcGIS – ArcView, ArcInfo, AutoCAD, MicroStation, ADAPT – AutoFine Rel. 14, CorelDraw, Photoshop
NASURSA	MicroStation, I_Ras C, Acrobat, ArcMap, SITNA Viewer, Raster Images and Feature server + extensions
GIJON	MicroStation, ArcGIS, Bentley Geographics, Geo Web Publisher, ArcReader
MEEDDAT	MapInfo, CARTELIE
AVINET	GIS/LINE (Norkart), WINMAP SQL (Norconsult), AutoCAD Map (Autodesk), ArcGIS (ArcView) (ESRI), Fysak (Statens Kartverk)

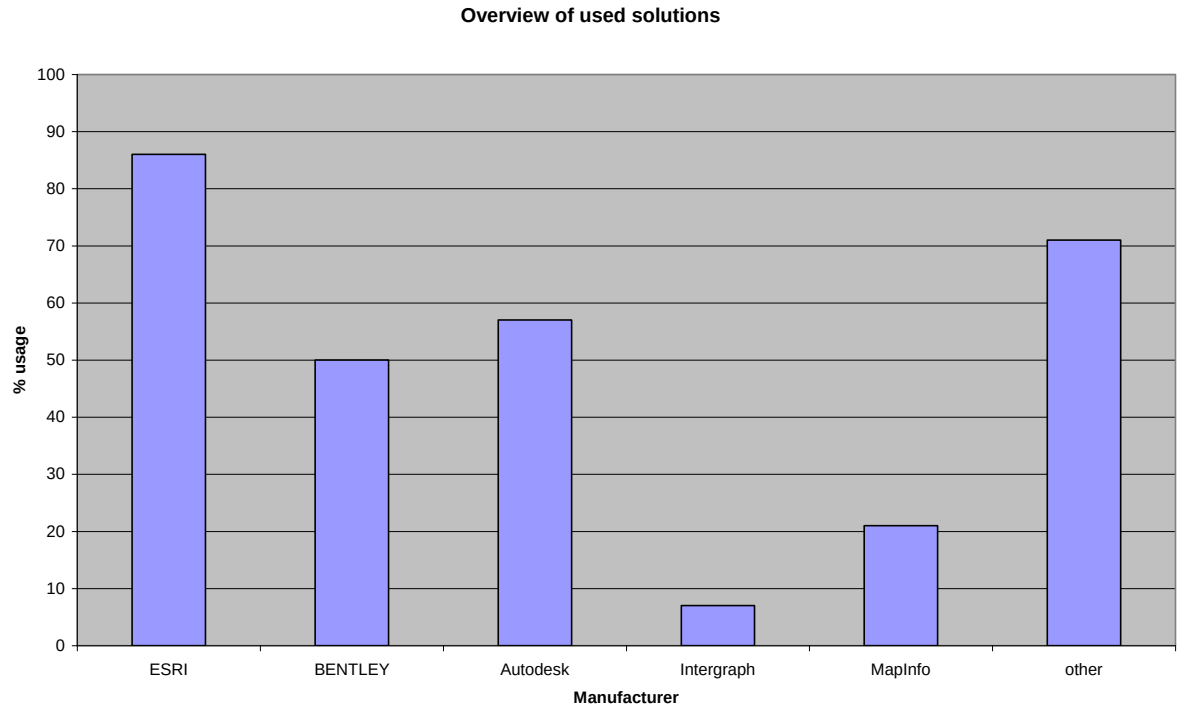


Figure 3: Overview of used solutions

2.6. Technological process

Evaluaters of the case studies were asked to describe technological process of data gatgering, maintenance, updating and publishing. Partners have different attitudes to answer this question, so it's quite difficult to compare the informations from the case studies in depth. So a "light overview" of processes held by content provider partners is drawn-out in the next table.

Table 4: Technological processes on planning data

Partner	Technological process:	plans available in digital form:	remarks	experiences on data interoperability on international level
Olomouc	Data gathering and updating - ArcView, Microstation;	partly	remote access documentation to look same as analogue	no experiences
PROVROMA	gathering and updating data in MapInfo, Oracle	dta available after registration, for intranet, download and editing some data possible	WMS and WFS services in progress	not mentioned
Lazio	data gathering by external companies.	Available for viewing, downloading in progress;		involved in several projects on data interoperability between regions

EPF	CAD products often used, big municipalities use GIS technology	only some municipalities publish plans on web	problems with conversion of data formats used for cadastral data	
ADR Nord Vest		partly	digital data accessible for bigger institutions.	Some institutions took part in EC data interchange projects
LGW Hamburg		all data accessible using WMS OGC services		experiences with harmonization in regional level
MAC	GIS officers in local authorities manage the process of data gathering, maintenance…	SDI is being developed		experiences on national level
ZPR	Municipalities submit data both analogue and digital form	only as a picture (JPEG or PDF format) Curently are data stored in MSSQL 2008, of PostGreSQL, first municipality published as WMS, WFS, Jekabpils, available ISO metadata and CSW	Currently run integration between MSSQL and GeoPortal	Experiences from GRISI+ project and Norwegian grant project
FTZ		Available to public at MEPA GIS server		
GEORAMA		Mostly in paper form, ocassionally provided for viewing	Patras – Georama partner provides for viewing at web servers	Only on national level
NASURSA	Scanning, georeferencing, edition and publishing of data	WMS services and document management system (SIUN	Not oriented to regional planning but to municipal planning.	Trials with interoperability on national level
GIJON	Internal GIS		digital data accessible for institutions.	not described
MEEDDAT	The objective of the system is to enable each target user to use the spatial data in digital form mainly through web services.	WMS services		Experiences with data harmonization in France
AVINET	data gathering and updating mostly external parties	OGC WMS services, some institutions WFS services	publishing focused on visual representation	no massive projects on cross border data harmonization, but some small trials

2.7. Metadata and INSPIRE

Metadata profile is one of the important Plan4all outputs. Are metadata collected by project partners – content providers? If yes, do they use standards? Do partners employ INSPIRE principles? These questions were answered in the case studies to make a brief review for work in Task 3.1

Table 5: Metadata collection and INSPIRE implementation overview

Partner	Metadata collection: always	partly	rarely	no	in progress	Standards used	INSPIRE principles implementation
Olomouc		✔				ISO 19115	Not yet
PROVROMA	✔					ISO 19115 subset	
Lazio	✔					ISO 19115 subset	Will be respected
EPF			✔			no standards used	National implementation strategy described
ADR Nord Vest			✔			Own standards if collected	Mostly no implementation on municipality level in region, only one municipality follows principles
LGW Hamburg						Not mentioned in case study, still work in progress	Implementation in force since 13.2.2009
MAC		✔				Different standards used in Ireland	Implementation in force
ZPR			✔			ISO19115/19119 and CSW 2.0.2	In progress
FTZ				✔		Planning to start collecting in near future	in progress
GEORAMA		✔				Military geographical service ISO 19135, Cadastre ESRI standard	Table of national organizations implemantation in case study
NASURSA					✔	New standard based on ISO 19115	Follows INSPIRE principles
GIJON				✔		Metadata not collected	Not yet
MEEDDAT					✔	Will be documented using ISO 19115	Implementation in progress
AVINET	✔					ISO 19115	Norway follows INSPIRE timeline as non memberstate

2.8. Users

BULGARIA		
users	**different purposes of using**	**type of plannning documents and datas**
Local administration of the municipality	managing and executing the plan;	
Ministry of Regional Development and Public Works	they are formal party in the process of approval the plan	
Ministry of the Environment and Water	they are party - protected territories and Natura 2000 territories as well as the systems of so called "Ecological Infrastructure" and water use;	
Other governmental institutions	to increase the parameters of the building permits and the expansion of the urbanized territories (especially those with recreational potential)	
Current and potential investors		
NGOs- currently the most interested in the plan are the environmental NGOs as well as some informal citizen organizations	limit the investment initiatives, especially along the seaside	
public		more generalized information, which will be available through the website of the municipality and the GIS server, which is currently in process of development;
PROVINCE OF ROME		
users	**different purposes of using**	**type of planning documents and datas**
Public Administration policy makers	decision-making activities	types of data are referred to most important interventions planned or in implementation phase, or to main environmental issue (risks, protection actions such as natural parks or archaeological or landscape constraints etc…).
Public Administration managers	operational activities: management, monitoring, government of the land use	type of data are generally referred to small/municipal scale (1:10.000 and lower) and an efficient interlink among different bases is required (cadastral, aero photogrammetric).
Public Administration planners	for planning and design activity	the higher level of information available and these data are aimed to define a specific plan.
Citizens, technicians, private social and economic groups	acces, amendments to the adopted plan, before his definitive approbation by Region	number of generic data, usually available at regional or provincial websites, also through commercial data companies or public institutions
Research studies and technical groups	produce and gather, targeted analysis and data suitable for specific purposes.	

OLOMOUC		
users	**different purposes of using**	**type of planning documents and datas**
Planning authority	planning permission and solving relations in region (modification of territorial relations)	local planning use planning materials and planning documentation
Politicians	fulfilling their political aims	planning documentation
Respective authorities	give protection of public interest in charge due to special rule, authorities issue binding assessments for issuance of the decision pursuant to Building Act	
Designers, city planners, architects	exploring area limitations, public infrastructure lines and structure specification needed for their work elaborates planning materials or planning documentation	use planning materials and planning documentation
Citizens	acquisition of planning permission, building permission or give requirements on Local plan changes, Regulatory plan or planning study procurement, buying or selling real estate,	Local plan or Regulatory plan
investor	for decision on investment, conditions for admissible use inadmissible use or conditional admissible use of areas	Local plan or Regulatory plan
Interest groups, NGO´s etc	the same position as Investors and Citizens in spatial planning processes. NGO should participate on planning permission process	
Geo-marketing companies etc	participate on planning materials and planning documentation elaboration as participants of designer,- Participate on contracts dealing with spatial data	planning datas at all
Researchers, students	solving particular problems like collecting source data, prognosis of development, demography etc.	
IRELAND		
users	**different purposes of using**	**type of planning documents and datas**
Ordnance Survey Ireland (Osi)	supplies most spatial data to many sectors	
appropriate Irish Environmental Authorities		
LGV HAMBURG		
users	**different purposes of using**	**type of planning documents and datas**
Member of municipal / county council		
Local administration of the municipality	participation of public authorities and public agencies in preparation of urban land use plans	Intranet mapping client for spatial data
Other governmental institutions		
Current and potential investors	searching for and finding industrial and commercial sites, information about ground value, electronic building application for planning permission,	
NGO		
General public	electronic participation of general public in preparation of urban land use plans	Internet mapping client for spatial data from the city of Hamburg and the Hamburg Metropolitan Region

NASURSA		
users	**different purposes of using**	**type of planning documents and datas**
Department of Spatial Planning	To get informed about interests of different sectors of society and to build consensus amongst them. To get informed about limitations and possibilities of policies affecting spatial planning (sector, nationwide, European policies). To approve a final plan according to Planning Act and other, existing plans. To coordinate the information flow during the planning process. To approve projects in accordance with current plans of all different levels.	Plans and regulations of other departments of regional administration and national administration Project proposals (residential development, road design, etc.) Own regional plans (proposals and final version) Municipal plans (proposals and final version)
Department of Environment	Environmental impact studies of all regional and municipal plans.	Own maps reflecting environmental regulations (Natura2000, flood risk, etc) Regional and municipal plans (proposals and final version)
Other departments	To ensure policies/infrastructures developed by the department are correctly incorporated in the plan.	Own information on departments domain (education – schools, civil works – road plans, etc) Regional and municipal plans (proposals and final version)
Municipalities	To ensure interests of the municipality are incorporated in the regional plan. To get informed about requirements for municipal planning coming from regional plans. Approval of licences or building permits. , To elaborate and approve detailed development projects in accordance with the current plan.	Paper versions of the municipal plan All input delivered by department of Spatial Planning.
Planning consultants	To carry out municipal/regional plans.	Same as municipalities
Citizens	To get informed about rights affecting ownership or living environment. To get informed about new proposals and their impact on their living environment. To participate in decision making (opposition, new proposals).	Paper versions of the municipal plan
Utility providers	To know where new urban expansion will take place in order to plan for the construction of new infrastructure. Reservation of space for future infrastructure. Consultation of detailed urban plans in order to construct infrastructure (i.e. environmental criteria such as tree protection).	Paper versions of municipal plans, sometimes even own impressions of possible new developments Corporate data on sewage, water tubes, etc
Other user groups (the Spanish national government, European regions, investors, interest groups)	To understand how effective spatial planning is in dealing with sustainable development. To share analysis and policy solutions. To know where to invest.	Inventory of existing land use (SIOSE) and planned land use (SIU)

ZEMGALE		
users	**different purposes of using**	**type of planning documents and datas**
Politics and public administration	develop the spatial plans ,decision-making activities.	
Planners	planning and design activity	the higher level of information available and these data are aimed to define a specific plan
Citizens	dealing with realty, plans to build up house or is interested in land use in his surroundings. Citizens are usually affected by Local plan or Regulatory plan. Citizens ask building offices (planning permission, building permission) or municipality office – (requirements on Local plan changes, Regulatory plan or planning study procurement)	access to a number of generic data (on website in jpg or pdf format), usually available at regional or provincial websites, also through commercial data companies or public institutions
(potential) investors	searching for best investment possibilities	Spatial plan and development programmes
interest groups, NGOs	allowed/planned usage for building/reconstruction. NGO should participate on planning permission process and public hearing processes	
Researchers, students	generally are able to produce and gather, in addition to the above mentioned data, targeted analysis and data suitable for specific purposes	Available in some local authorities websites as well as in printed versions at the local authority
other public and private data users / experts / service providers, i.e. geo-marketing-companies, map-makers, ..	Could be that category, but the data is only for public authority internal use	
MEEDDM		
users	**different purposes of using**	**type of planning documents and datas**
The users that are referred to hereinafter are all those involved in the building permits instruction process managed by the state administration (DDEA) it includes the process of local spatial planing document digitisation		
The “maître d’ouvrage”	is the body responsible for turning digital the existing local spatial plansIt generally sub-contract the work to third parties, his role includes checking the quality of the result, i.e. that the digital version is exactly equivalent to the paper version	
The “maître d’oeuvre”	the body in charge of producing the digital version of PLU,CC and SUP	

The "petitioner" the person that asks for an authorisation to build something on a given parcel ("pétitionnaire"). He may be either the parcel owner or a proxy such as an architect	the person that asks for an authorisation to build something on a given parcel ("pétitionnaire"). He may be either the parcel owner or a proxy such as an architect.His concern regarding the local spatial plans (PLU or CC) is to know the rights and constraints that apply to his parcel	
the "instructor"	will instruct the request and propose to the mayor the decision authorizing or not the building. His concern regarding the local spatial plans is whether or not the building is authorised including identifying the associated parties that need to be consulted	
The "associated party" the person that is consulted regarding the public utility constraints that may apply to the parce	the person that is consulted regarding the public utility constraints that may apply to the parce.His concern is to locate the parcel where the building may be built and check distance to the point that generate a constraints	
The mayor the person that authorises or not the building	the person that authorises or not the building.His concern is to view the location of the building permit superimposed on the local spatial plan	
The prefecture (representing locally the state government)	is in charge of verifying the lawfulness of the building permit process. His concern regarding local spatial plans is to identify the building permit requests that need a thorough scrutinising by his services	
Planners	survey how the built up areas develop through time, theyidentify the areas where there is potentially rooms for new building and monitor the urban sprawl development	
	GIJÓN	
users	**different purposes of using**	**type of planning documents and datas**
Spatial planning authorities	- Preview and search of the territory's data at a local and regional level (such as the General Spatial Planning and the steering plans of the Autonomous Region) -Management of geospatial databases -Data export to different formats. - Data update and maintenance - Browsing via WMS service with the option of geospatial queries -Import of changes made by compilers, as well as import of data from external sources and in different formats.	
Other Public authorities	- Preview and search of the territory's data: spatial or environmental planning, land use, infrastructures, etc.	

Owners of transport systems and technical infrastructure	- Development of convertion tools from data models - Easy import of data from external sources. - Update and maintenance ot the technological infrastructure.	
Spatial planning engineers, city spatial planners	- Documentation preview via WMS servers with the option of searchin on geospatial data - Limited possibilities of editing for planning adjustments.	
Companies, NGO	- Documentation preview - Metadata catalogue preview	
Investors and real state owners	- Documentation preview - Metadata catalogue preview - Access to your property's data by means of safe identification (electronic signature)	
Real state agents	- Documentation preview - Metadata catalogue preview - Search of urban zoning	
Public , Students	-Documentation preview via web-based on thin client. - Metadata catalogue preview Availibity of analysis functions on the data provided in the portal.	

The table summarises the current users of planning data and the documents in various States, and how do they use them.
There are corresponding groups of users from the case studies and these are schematically representated

Scheme of actual groups of users

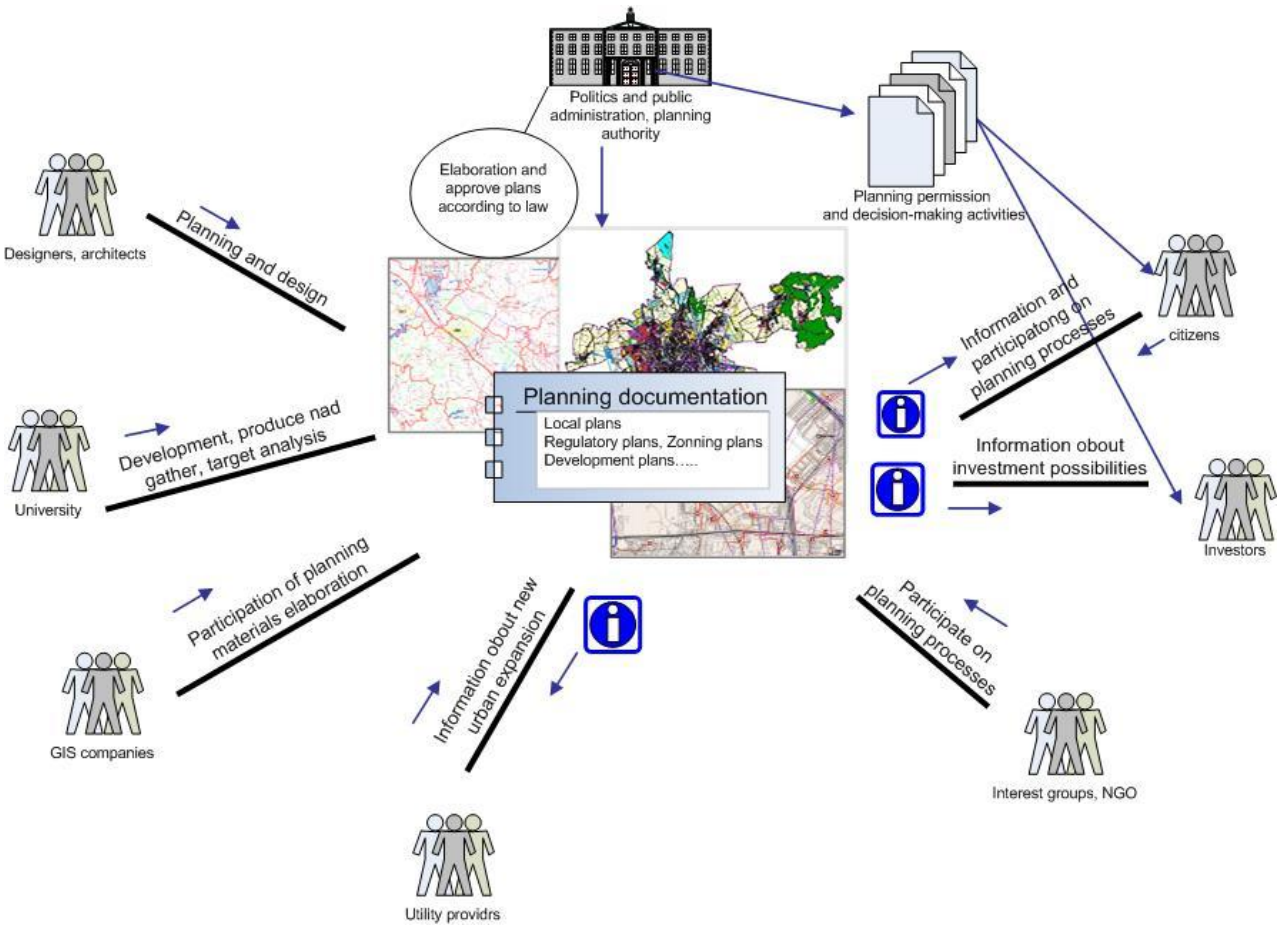


Figure 4: Scheme of actual group of users

Note, that the description of user groups in the Case studies is a subjective overview elaborated by project partners and is influenced by their experiences. The scheme shows, that user groups described in Case studies are mostly participating in the elaboration of plans. (their role in the elaboration/negotiation of plans is strongly percieved by project partners). Information from plans are requested by user grups citizens, investors and utility providers. Surprisingly, NGO's are not percieved as "information seekers", the only explanation is, that NGO's are using remote access documents more often than other groups and are asking planning authorities only when they are in doubt.

2.9. Digital Right Managements

2.9.1. IPR and business models

The IPR and business model questions seek to determine local policies on dealing with digital content in spatial planning. IPR questions related to digital content are not usually taken as problem to be solved by special legislation. Mainly general Copyright Acts are applied for digital rights management. Business models for spatial planning data sharing aren't established in most cases. The Plan4all project shoud give guidelines or basic requirements for establishing business models on regional or local level in accordance with INSPIRE direction.

Table 6: IPR and business models used by project partners

Partner	IPR model	remarks	Business model
Olomouc	on national level Copyright law applied to some planning documentations.	Usage of data provided for planning purposes regulated by Building Act - are available only for planning activities	no
PROVROMA	ProvRoma has not the property of all possessed data		no
Lazio	Lazio has not the property of all possessed data		yes
EPF	no specific IPR and business models		
ADR Nord Vest	National Copyright LAW	Official texts are not protected	no
LGW Hamburg			
MAC	Copyright Act on national level		
ZPR	Spatial plan data belongs to public authority, base data belongs to providers – cadastre etc.		no
FTZ	No IPR model applied to spatial data		no
GEORAMA	The Law system decides what data, information or documents can be disclosed to a particular user. Its basis is not formed only by technology but especially by the legislative framework and the corresponding IPR.	No copyrights for planning documentation, planning materials aren't provided in editable format. – no neeed of protection	no
NASURSA	Data should be freely available, according to law.	SIUN (information system of municipal plans) is open to the public, although only PDF format is offered	no
GIJON	Local governments (municipalities) are the owners of their own spatial planning paper documents	No information	
MEEDDAT	Local governments (municipalities) are the owners of their own spatial planning paper documents	Shared ownership of digital version of planning documents betwen owners (e.g. municipalities, and organizations that have funded the digitization process.	
AVINET	no legislative for right issues related to planning data		

2.9.2. Data availability

In most European countries spatial plans are accessible by the public, at least in analogue form. Despite providing spatial plans, as thematic cartography work is a very important task of the public information process, for exploitation, spatial data sharing is much more interesting. Descriptions of data availability in project partner organizations ilustrate different attitudes to publishing spatial plans and the data included in those plans.

Table 7: Availability of data included in spatial plans

Partner	free access	registration	limited access	for a fee	remarks
Olomouc	Raster images of planning documentation, viewing		planning analytical materials – for planners contracted		
PROVROMA		view only			specific regulation on data migration need to be implement
Lazio				reproduction expenses	requirements on written form
EPF	viewing graphical part of planning documentation				
ADR Nord Vest					to digital data public has rarely free access
LGW Hamburg					
MAC	PDFs in most cases, some Councils have online view-only GIS access.				Most access is still on paper.
ZPR	Currently are data transferred into shp, first data are will be stored on MSSQL or on Geoportal/	For editing	For editing for municipal planners		
FTZ	MEPA map server for viewing			Downloading printable version of documents	
GEORAMA			Only for planning studies and documentation drafters		Planning documentation data ids not nationally regulated, depends on municipality decision
NASURSA	Yes	No	No	No	It's planned in the future a restricted area (user-password) for

					exchanging information among teams participating in planning technical instructions elaboration.
GIJON	Ortophotos 50cm/píxel	Vectorial Cartographic		Downloading printable version of documents	
MEEDDAT	Public sector data must be made available for free to all interested parties at the point of storage				
AVINET	for viewing			depends on owner of datsets	

3. Requirements and proposals

3.1. Requirements overview

This chapter describes the overall list of user requirements reported by project partners

	General Requirements	Requirements on interoperability	Requirements on data models	Requirements on metadata	Minimum data set	Preferable data model and dataflow	Ideas regarding Digital Right Management
Olomouc	user group specification, do not standardize data format, data model, standardize presentation form and processes	Standardization of the legend separately on the both regional and local levels, 2.1.1.3. Application processes for transformation of data models	do not standardise national models	INSPIRE implementation rules with additions, copyright extension, metadata displaying according to user group (details in CS)		to current data model, specification of P4A datamodel and transformation processes	DRM specified
LGV Hamburg		To combine spatial data and services from different sources across the European Community in a consistent way without involving specific efforts of humans or machines	data specfication - ISO 19131, model description UML, XML (GML) files	Regulation 1205/2008/EC	specified for spatial and regional planning, land-use plans, binding land-use plans, theme “Area management/restriction/regulation zones and reporting units”, theme “Natural risk zones”	“XPlanung / XPlanGML”	
PROVROMA	municipalities must develop their planning instruments (normalization of legends, graphic symbols, digital files and cartographic base) and to develop its data model in accordance with the Guidelines INSPIRE	Vertical interoper. (municipality-provinces-region)	to adopt a structure with thematism progressive levels regarding the planning tool based on the model of Corine Land Cover for greater compatibility with lower- and higher-level tools = compatibility between PTPG and PUC	existing metadata profile defined by CNIPA (see table in CS); the switch from the standard current to the CNIP, specifed in CS	specification of dataset for interoperability, example in CS	specification of layers, components, classes and properties; INSPIRE principles, dynamic links to external data sources	free access to spatial planning data – according to INSPIRE principles - during publishing phase of urban planning process

	General Requirements	Requirements on interoperability	Requirements on data models	Requirements on metadata	Minimum data set	Preferable data model and dataflow	Ideas regarding Digital Right Management
Nasursa	To improve instant access to detailed information of all municipal and regional plans in a certain location, without the need to know the geographical extension of plans. To harmonize limits between plans. To harmonize concepts.	Municipal Structuring Planning according to Planning Technical Instructions must be available for WMS and WFS publication; Planning information according to National Urban Information System must be available for WMS and WFS publication	To achieve a common data model following INSPIRE principles and recommendations	IDENA (ISO 19115 based and INSPIRE compliant) profile implementation.	All maps included in regional spatial plans Standardized information layers of municipal plans: Scope. Spatial area. Classification. Categorization. Sector. Distribution areas. Execution units. Resources and services. Global uses.		
GIJON		• The basic functions of geographic information systems • According regulation and legislation • Map export for different uses (reference, documentation, etc…) • easy import of geospatial data into our database	• Data and documentation preview • Data browsing via WMS service with the option of attribute and spatial questioning about geospatial data • Data editing and multi-user access with revision control	interoperability and INSPIRE compliance; Metadata catalogue preview			Commercial distribution

	General Requirements	Requirements on interoperability	Requirements on data models	Requirements on metadata	Minimum data set	Preferable data model and dataflow	Ideas regarding Digital Right Management
MAC		move all of the relevant GI databases towards INSPIRE compliance, in line with Government policy	To assume the Irish INSPIRE datasets in broad terms (see Annex B) indentified by The Department of Environment, Heritage and Local Government and the data themes defined by the Irish INSPIRE Technical Subcommittee (see Annex A);	moving towards a common metadata (especially as typified by the ISDE, as well as other initiatives, such as EDEN, and the previous Geo-ID)	specified in Annexes of CS	Architecture speccified in CS; OGC and ISO standards and INSPIRE compliance	
EPF		To move available GIS databases, used for spatial planning purposes, towards INSPIRE compliance; to solve problems with diferent specific standards (cadastral data)	Metadata standars is missing, implementation of Plan4all solution compliable with INSPIRE				
ADR Nord Vest	To solve lack of complete, accurate digital maps, lack of knowledge and clear objectives regarding models, standards, and metadata	no concepts for spatial data, data exists in scattered form					Security and digital property issues are taken into account, but do not seem a very important issue for most institutions. Of course, all databases are protected in a way or another

	General Requirements	Requirements on interoperability	Requirements on data models	Requirements on metadata	Minimum data set	Preferable data model and dataflow	Ideas regarding Digital Right Management
Lazio	standardisation for thematical data	To respect national documents, that are in progress	To respect national documents, that are in progress	to assume minimum requirements for metadata defined by workgroup from National Archive of the Territorial Data	respect the decision of the Committee for the definition of a shared standard on a national level	11 informative layers, each one focuses a specific theme – described below in this document	some data is from external private companies - can be transferred only with data owners permission; the other data can be used without restriction
Avinet	To improve data sharing process - quick access to planning data across administrative boundaries nationally/internationally;	OGC / ISO adopted standards level of WMS, WFS, CSW; joint data model must be able to represent planning features represented as points, lines or polygons.	model must be capable of representing planning datasets consisting of point, line and polygon features: - Each dataset should have associated metadata - Each feature may have varying attributes associated with it - Each feature may have more than one legal planning category associated with it	minimum mandatory subset of the ISO 19115:2003; collecting the appropriate metadata for horizontal and vertical spatial reference systems; for Norway needs to conform to the SOSI standard	Base maps - 1: 5 000 - 1:5 000 000 topographical maps (N5 – N5000) Planning data - Overview plans (created in individual municipalities and regional authorities)	Themes described below in this document Standartisation for data visual presentation	no defined IPR policy for digital planning data in Norway

	General Requirements	Requirements on interoperability	Requirements on data models	Requirements on metadata	Minimum data set	Preferable data model and dataflow	Ideas regarding Digital Right Management
Georama		The geodetic reference system and measurement units; mainly used the WGS84 format and an initial transformation is needed there. Standardized legend at a minimum set (e.g. border of areas etc) for all authorities at all levels and for the needs of Plan4All portal Application processes for transformation of data models between different SDIs Common understanding for the development of interoperable network search services (using WSDL, OWSL)		Metadata transfer according to INSPIRE 3 discovery types / see case study		Query - metainformation Graphical support - visualization portal - metadata catalogue and geospatial data storage	
MEEDDM		Semantic interoperability of the graphical expression of local spatial planning documents Regulation interoperability	Model must be able to cope with models that will be different It may be worth considering a mechanism enabling the computer description of each national model for the details and adopt the simplified model based on the main categories Proposal of the data model in the Case Study	To include a description of the nation (country) data model that apply to the data Set Enumeration list for each country which state the name and code of each constraint together with the type of geometric description of the constraint that apply to the land	The minimum data set for the standardisation process must firstly conform to the same structure		the possibility to insert © statements

	General Requirements	Requirements on interoperability	Requirements on data models	Requirements on metadata	Minimum data set	Preferable data model and dataflow	Ideas regarding Digital Right Management
ZPR	standardisation for thematical data in the national level	documentation preview map export for using as a material metadata catalogue preview	Standardized legend of plan phenomena of all municipalities for the needs of Plan4All portal Application processes for transformation of data models in horizontal and vertical direction (it is a technical solution)	INSPIRE implementation rules with additions, copyright extension, metadata displaying according to user group		Inquiry Visualization Geospatial Plan4All portal Distribution Synchronization Data exchange	Data distribution depends on the current national legislative framework

3.2. Requirements by User Groups

This chapter summaries user requirements regarding user groups as defined in the case studies or survey (see Annex 3).

3.2.1. Spatial planning authorities

- Data preview within their administrative territory and "border zone" at local and regional level (as for the plan, the data preview means also the interconnection of attributes of individual elements with the text part of the plan – regulations related to individual areas with different way of usage)
- Data management in form of geospatial database
- Data editing
- Data browsing via WMS service with the option of attribute and spatial questioning about geospatial data.
- Publishing of restricted volume of geospatial data to the compilers
- Import of changes made by compilers into the unified data warehouse (revision control and comparison of contents of the data sets and their synchronizing)
- import of changes made by compilers into the unified data warehouse (revision control and comparison of contents of the data sets and their synchronizing)

- Lossless data exchange between the actors involved in planning processes

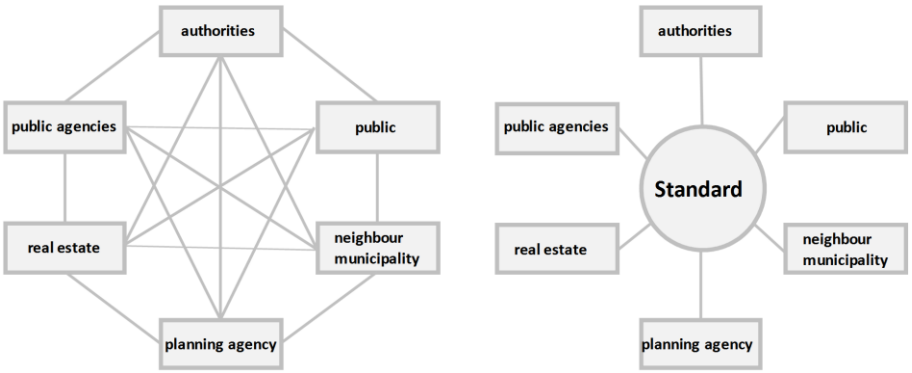


Figure 5: Lossless data exgange between the actors involved in planning process

- Standardised data exchange format for horizontal (intermunicipal) and vertical (planner – municipality – county – federal state) process of coordination of planning
- Support electronically assisted proceeding on the granding of planning permission
- Standardised data format for e-participation platforms
- Semantic description of planning data as a basis for the establishment of services (query, monitoring, reporting) and visualisation in different software applications
- Central storage of urban land-use plans / other plans of special urban planning legislation (e.g. formally designated redevelopment area) in a uniform semantic structure as a data base for different software applications and information systems
- Visualisation original legal plans by Web Map Service (bit mapped raster graphic + overlaying vector data to no visualization style is assigned, which carries however

feature data for WMS get feature info queries) for a municipality and their surroundings

- Visualization the scope designated by a binding land use plan by Web Map Service + Visualization of the original legal plan as PDF file for a municipality and their surroundings
- Visualisation INSPIRE annex III compliant land use data sets as a SLD/SE Web Map Service
- Metadata search for:
    - Name and number of urban land use plans
    - Information to the date of establishment, public display period, notification of permission of urban land use plans
    - Legal foundation of urban land use plans
    - Main designation of land use purpose
- Free access to spatial planning data
- The implementation at national level of standards regarding data collection (also applying to metadata)
- Interoperability of all spatial data collected, standardization of software that could be used (standardization of features, functions and data that can be processed)
- Data browsing and data editing via WFS-T service (Web Feature Service - Transactional) with the option of attribute and spatial questioning about geospatial data, with the purpose of final validation of planning data at any level. WFS-T service has bidirectional characteristics, which enable to manage data flows from the regional or provincial authorities to the municipalities and vice-versa, so efficiently supporting the shared validation of the planning data.
- Basic data processing
- Data export to different formats

3.2.2. Other Civil Service authorities

- Preview of the planning documentation in case of publishing opinions on the negotiated planning documentation;
- Nature conservation authorities that need delimitation of TSES from the plans (where it is mandatory) for publishing opinions within the common work agenda (for modification of TSES)- are a special case
- Visualization of the original legal plan by Web Map Service (bit mapped raster graphic + overlaying vector data to no visualization style is assigned, which carries however feature data for WMS get feature info queries)
- Visualization of the scope designated by a binding land use plan by Web Map Service + Visualization of the original legal plan as PDF file
- Providing the scope designated by binding land use plans and the vector data of urban land use plans by Web Feature Services
- Supply of an electronic participation platform
- Meta data search for:
    - Name and number of urban land use plans
    - Information to the date of establishment, public display period, notification of permission of urban land use plans
    - Legal foundation of urban land use plans

    - Main designation of land use purpose
- Querry the displayed information to access the actual regulation part that apply to the parcel

3.2.3. Owners of transport and technical infrastructure

- Easy import of geospatial data into the database of Spatial planning Authority
- Possibility of dynamic conversion of the data models (import) of geospatial data of the technical infrastructure providers into the planning data model. The goal is to implement the technological processes for the most automatic processing of the entry data from various, but known sources. Still, there is a risk of DM instability for data output on the part of providers.
- Awareness, openness, accessibility and seamless interoperability are their major requirements.
    - These will be addressed through INSPIRE compliance particularly through use of a scaled-up ISDE.
- This will need to interwork with other existing infrastructures, such as the GeoDirectory, EDEN (Environmental Data Exchange Network) and specific widely used applications such as the LGCSB's gPlan system.
- Visualization of the original legal plan by Web Map Service (bit mapped raster graphic + overlaying vector data to no visualization style is assigned, which carries however feature data for WMS get feature info queries)
- Visualization of the scope designated by a binding land use plan by Web Map Service + Visualization of the original legal plan as PDF file
- Providing the scope designated by binding land use plans and the vector data of urban land use plans by Web Feature Services
- Supply of an electronic participation platform
- Meta data search for:
    - Name and number of urban land use plans
    - Information to the date of establishment, public display period, notification of permission of urban land use plans
    - Legal foundation of urban land use plans
- Main designation of land use purpose

3.2.4. Planning engineers, city planners

- Documentation preview
- Map export for using as a material
- Metadata catalogue preview
    - Commentary:
        - Retrieval of civil engineering main data provided by their administrator is very limited. Their mass distribution to the users of this group cannot be expected. Appropriately designed business model (future question) could solve this problem to satisfaction of all interested parties.
- Planning engineers of the plans and planning studies are a special case – if they project the planning documentation or the planning studies, they can get the data, and they should have chance to download the data directly

- For spatial planning data preview prefer to use the WMS server or the web-based thin client that enables printing of a map part or the whole plan
- Download the data of the currently projected area and the mentioned buffer (via WFS) while working to order

- Visualisation original legal plans by Web Map Service (bit mapped raster graphic + overlaying vector data to no visualization style is assigned, which carries however feature data for WMS get feature info queries) for a municipality and their surroundings
- Visualization the scope designated by a binding land use plan by Web Map Service + Visualization of the original legal plan as PDF file for a municipality and their surroundings
- Urban land use plan has to be allocated in a standardised data exchange format to the municipality
- Meta data search for:
    - Name and number of urban land use plans
    - Information to the date of establishment, public display period, notification of permission of urban land use plans
    - Legal foundation of urban land use plans
    - Main designation of land use purpose
- Download of data, to be used as professional working material (with different levels of access according to the types of users - and also in line with INSPIRE: for example, the professionals pay for the data they use, the general public has a free but limited access, etc.) - Please note: access to SDI data cannot be provided, according to national laws, before the first step of the adoption of any territorial and urban plan.
- Catalogue of plans, comprising all relevant regulations and legal deliberations.
- Possibility to view and overlay maps, adding themes from different databases; possibility to perform simple graphic operations such as buffering, drawing objects, measuring, etc.; possibility to print parts of the maps.
- Possibility to download data in GIS-compatible formats.
- Basic data processing
- Limited possibilities of editing for planning adjustments.

3.2.5. Firms

- Visualization of the original legal plan by Web Map Service (bit mapped raster graphic + overlaying vector data to no visualization style is assigned, which carries however feature data for WMS get feature info queries)
- Visualization of the scope designated by a binding land use plan by Web Map Service + Visualization of the original legal plan as PDF file
- Visualization of INSPIRE Annex III Themes: protected sites, Area management/restriction/regulation zones and reporting units, Natural risk zones, Bio-geographical regions, Habitats and biotopes, Species distribution, Energy resources, Mineral resources
- Access to ground value information
- metadata catalogue preview
- Meta data search for:
    - Name and number of urban land use plans

- Information to the date of establishment, public display period, notification of permission of urban land use plans
- Legal foundation of urban land use plans
- Main designation of land use purpose (e.g. industrial area, commercial area, centre zone

- Possibility to perform simple graphic operations such as buffering, drawing objects, measuring, etc.; possibility to print parts of the maps.
- Possibility to download data in GIS-compatible formats.

3.2.6. NGO

- Documentation preview - Visualization of the original legal plan by Web Map Service (bit mapped raster graphic + overlaying vector data to no visualization style is assigned, which carries however feature data for WMS get feature info queries)
- Visualization of the scope designated by a binding land use plan by Web Map Service + Visualization of the original legal plan as PDF file
- Metadata catalogue preview
- Meta data search for:
  - Name and number of urban land use plans
  - Information to the date of establishment, public display period, notification of permission of urban land use plans
  - Legal foundation of urban land use plans
  - Main designation of land use purpose
- Possibility to export maps
- Access to WMS with the possibility to download and analyze, make different measurements
- Catalogue of plans, comprising all relevant regulations and legal deliberations.
- Possibility to view and overlay maps, adding themes from different databases; possibility to perform simple graphic operations such as buffering, drawing objects, measuring, etc.; possibility to print parts of the maps.
- Possibility to download data in GIS-compatible formats.
- WMS giving the possibility to work with local and remote data.

3.2.7. Investors, real estate owners

- Documentation preview - Visualization of the original legal plan by Web Map Service (bit mapped raster graphic + overlaying vector data to no visualization style is assigned, which carries however feature data for WMS get feature info queries)
- Visualization of the scope designated by a binding land use plan by Web Map Service + Visualization of the original legal plan as PDF file
- Access to ground value information
- Metadata catalogue preview
- Metadata search for:
  - Name and number of urban land use plans
  - Information to the date of establishment, public display period, notification of permission of urban land use plans

    - Legal foundation of urban land use plans
    - Main designation of land use purpose (e.g. industrial area, commercial area, centre zone
- Commercial distribution of the "value" map
- A map application (e-shop) would be prepared for this user group; it would be possible to buy a map made up of layer combination of the Price map, Plan, Regulation plan etc.there
- Catalogue of plans, comprising all relevant regulations and legal deliberations.
- Possibility to view and overlay maps, adding themes from different databases; possibility to perform simple graphic operations such as buffering, drawing objects, measuring, etc.; possibility to print parts of the maps.
- Possibility to download data in GIS-compatible formats.
- WMS giving the possibility to work with local and remote data.

3.2.8. Real estate agents

- Documentation preview - Visualization of the original legal plan by Web Map Service (bit mapped raster graphic + overlaying vector data to no visualization style is assigned, which carries however feature data for WMS get feature info queries)
- Visualization of the scope designated by a binding land use plan by Web Map Service + Visualization of the original legal plan as PDF file
- Access to ground value information
- Metadata catalogue preview
- Meta data search for:
    - Name and number of urban land use plans
    - Information to the date of establishment, public display period, notification of permission of urban land use plans
    - Legal foundation of urban land use plans
    - Main designation of land use purpose (e.g. industrial area, commercial area, centre zone
- Commercial distribution of the "value" map
- A map application (e-shop) would be prepared for this user group; it would be possible to buy a map made up of layer combination of the Price map, Plan, Regulation plan etc.there
- Catalogue of plans, comprising all relevant regulations and legal deliberations.
- Possibility to view and overlay maps, adding themes from different databases; possibility to perform simple graphic operations such as buffering, drawing objects, measuring, etc.; possibility to print parts of the maps.
- Possibility to download data in GIS-compatible formats.
- WMS giving the possibility to work with local and remote data.

3.2.9. Public

- Documentation preview - Visualization of the original legal plan by Web Map Service (bit mapped raster graphic + overlaying vector data to no visualization style is assigned, which carries however feature data for WMS get feature info queries)
- Metadata catalogue preview
- Catalogue of plans, comprising all relevant regulations and legal deliberations

- Metadata search for:
- Name and number of urban land use plans
- Information to the date of establishment, public display period, notification of permission of urban land use plans
- Legal foundation of urban land use plans
- Main designation of land use purpose
- View the area where citizen's parcel is located (orthophoto, spatial planning documents)
- Query if they are constraints that apply to the parcel
- Check his project meets the constraints
- It would be also good to have the analytical functions option over the data within the portal – e.g. finding the projected areas for living, up to the distance of 5 km from city centre as a part of documentation preview
- Adding the comments into the map (user's graphics) at the time when the planning documentation is discussed
- Possibility to add comments - new information
- Visualization of the scope designated by a binding land use plan by Web Map Service + Visualization of the original legal plan as PDF file
- Points of interest on the requested maps by category
- Possibility to add comments, new information

3.2.10. Researchers, Students

- Documentation preview - visualization of the original legal plan by Web Map Service (bit mapped raster graphic + overlaying vector data to no visualization style is assigned, which carries however feature data for WMS get feature info queries) + Visualization of the original legal plan as PDF file
- Data & metadata catalogue, with possibility of listing and grouping the data under different classifications.
- Metadata catalogue preview
- Meta data search for:
- Name and number of urban land use plans
- Information to the date of establishment, public display period, notification of permission of urban land use plans
- Legal foundation of urban land use plans
- Main designation of land use purpose
- Visualization of the scope designated by a binding land use plan by Web Map Service
- Providing the scope designated by binding land use plans and the vector data of urban land use plans by Web Feature Services
- Catalogue of plans, comprising all relevant regulations and legal deliberations.

3.2.11. Common requirements

- Data views of spatial plans, both in stage of elaboration, as well as the final plan
- Common requirements on data combination: co-visualisation of spatial planning documents and other mapping documents such as orthophotos, current cadastral map

and other geographical data which affects spatial planning (environmental limitations etc.)
- Data views of spatial plans of different administrative units, to compare different areas and different planning scales.
- the basic functions of geographic information systems
- Analytical tools to do customized consultation
- And their disclosure in the form of map projects (thin client, WMS or WFS), raster outputs or database descriptive data
- Tools to add comments and suggestions
- Browse the spatial planning regulations that apply "on-line" translation into mother toungue language

- **INSPIRE awareness and acceptance**.

3.2.12. Spatial requirements

- development and supply of "plan4all" database schemata (e.g. land-use for Oracle or PostgreSQL/PostGIS)
- Definition of SLD / SE portrayal stiles for "plan4all" themes
- WMS and WFS servers
- Location based querrying of textual documents

3.2.13. Additional remarks

There is definitely a need for a more transparent accessibility of plans which are still in the phase of preparation. Better availability will enable both administration (other departments, other administrative levels) and society (citizens, interest groups, service providers) **to participate pro-actively in the elaboration of plans**. However, this would require a change of planning culture from a hierarchical, bureaucratic practice to an open minded, transparent and participative way of planning.

A request from all interviewees is to improve instant access to detailed information of all municipal and regional plans in a certain location, without the need to know the geographical extension of plans which possibly affect that particular site. There are many potential applications:

- For municipalities and regional administration as **to improve new planning documents, avoiding overlap of conflicting planning units**)
- For municipalities and regional administration **to raise transparency and efficiency in procedures** for issuing licences, building permits, etc.
- For other departments to analyse existing plans in order **to design new policies**, such as for example measures against habitat fragmentation by the Department of Environment)
- For project developers or utility managers **to anticipate investments** based on knowledge on detailed conditions of new project proposals.

At a higher scale level, and probably of a more strategic nature, there is a need **to better understand possible synergies and conflicts between territorial and sectoral strategies of**

different levels. Particularly the positioning of regional plans compared to strategies of neighbouring regions and of higher levels (Spain, Europe and territorial cooperation areas) is still poorly developed.

3.3. Requirements in detail

This chapter describes in detail the important or most interesting requirements and ideas from the case studies.

3.3.1. Requirements on interoperability

Olomouc

Horizontal and vertical interoperability

By the term horizontal interoperability we mean the process of the **unified definition of the monitored phenomena** (for plans and planning analytical materials).This definition should be the basic listing of all three types of the used data models at the local level in the Czech Republic. A rule should be applied that any monitored phenomena in the local DM is classifiable just into one of the categories of the unified data model without breaking the semantic bonds of other phenomena from the local DM. The aim of the other condition is to project the less detailed categories of the unified data model in conformity with the spatial planning practise. Into so designed DM Plan4All, the other data models should be transferred automatically via **transformation processes**.

By the term vertical harmonization we mean **setting of the rules for transformation process of the data models** (of plans and PAM) on the basis of semantics of the phenomena used in data models at local, regional, national and European level.

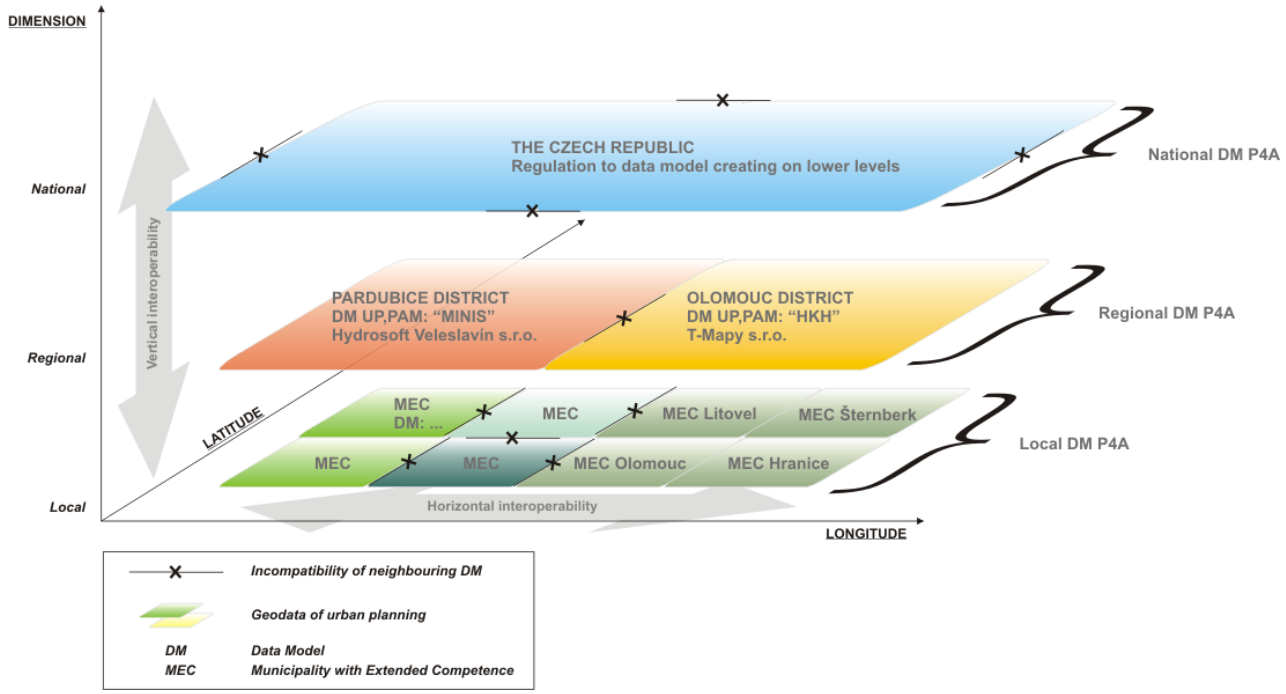


Figure 6: Spatial scheme of the sample distribution of the data models in the Czech Republic

In establishing interoperability rules, we therefore do not see the setting of the unified data format, the unified data model and the unified geoinformation technology for all producers of geospatial data! Local specifics should be respected, whereas the information continuity feature across territorial units should ensure:

- Standardized legend of the PAM monitored phenomena separately for the local and regional level, and the legend of plan phenomena of all municipalities for the needs of Plan4All portal
- And application processes for transformation of data models in horizontal and vertical direction (it is a technical solution)

Standardization of the legend (interoperability of local level)

We would appreciate the possibility to display the geographic data from the plan and planning analytical materials across the data sets of the local level (especially in "border zones") via a single legend. Considering the diversity of the used DM, there appears a solution via so-called semantic translators that would create semanticaly identical data sets – classes of elements – and rules for their physical construction (point marked by letter b) - in all known DMs.

Step no.1 – editing of the locally used data models

The first step should be editing of the local data models both in the context of the current Building Act and the current needs of spatial planners:

- A)Analysis of the conflicts of practical needs of spatial planners with the current DM in the context of the current Building Act
- B)Change of the local DM of "HKH" type, change of the plan, etc.

Task for: Olomouc City Council

DM "HKH" edited for our needs will be the outcome.

Step no. 2 – definition of the DM P4A of the local level

The second step would be the reorganization of element classes used in DM in the Czech Republic and the neighbouring regions. In this process the injection rule should be adhered. One single model P4A of the local level will be created from the local models. Naturally, this will create a list of rules for the process of horizontal transformation of local data models, which needs a technical solution (point marked by letter B).

Task for: Czech participants of Plan4All project

DM P4A applicable for geospatial data of the local level in the Czech Republic will be the outcome.

Step no. 3 – definition of the cartographic symbols for the phenomena of the P4A data model of the local level

Creation of a file with symbols for phenomena listed in the DM P4A.

Task for: Czech participants of Plan4All project

A set of cartographic symbols for phenomena from the DM P4A of the local level will be the outcome.

Standardization of the legend (interoperability of regional level)

Phenomena of the spatial planning monitored at the regional level should be unified by analogy with the previous.

DM P4A applicable for geospatial data of the regional level in the Czech Republic will be the outcome.

A set of cartographic symbols for phenomena from the DM P4A of the regional level will be the outcome.

Application processes for transformation of data models

By application processes, we mean a technical solution that would transform DM into DM P4A form of the local, regional and national level on-the-fly.

In addition (in comparison with the horizontal harmonization), data generalization will be needed within the vertical harmonization processes. However, in principle they are the identical ways of data processing.

We use several types of DM:

Planning analytical materials:

DM we use is marked "HKH" and it is one of the three types of the DM used for PAM in the Czech Republic.

Requirements:

- to edit the classes of elements in the context of the current Building Act
- to extend the physical DM by connection of the elements and topics (category that is the attribute of data logging in XML „<gmd:topicCategory>“) that would enable the semantic translators to accomplish a generalization suitable for the goals of Plan4All project and make the metadata searching in their central data warehouse P4A easy

Plan

Currently we are preparing and processing a new plan of the Olomouc City. Its DM will be based on the mentioned "HKH" type. Currently, the DM is adapted to the technological processing in the CAD system and from this reason it has to be modified for GIS. Considering the fact that each municipality deals the problem of digital processing method individually and we as the MEC do not have the right to interfere in contractual relations between municipalities and compilers, we require the establishment of rules for semantic translators. They would transfer the classes of elements from the used DM into our "HKH".

Thus, the basic requirements are:

- The resulting DM P4A should be based on the Act no 501/2006 Coll. on the general requirements for land use
- And it should be based on the DM "HKH"

Avinet

- Service level interoperability
  - We require services to be interoperable on the OGC / ISO adopted standards level of Web Map Services (WMS), Web Feature Services (WFS), Web Catalogue Services (CSW)
- Feature level interoperability
  - Joint data model must be able to represent planning features represented as points, lines or polygons. Edge matching across international or internal administrative borders is not critical. A joint agreed border to which countries are completing their maps is desirable.
- Attribute level interoperability
  - Attribute level interoperability is not required – but it would be interesting if some sort of semantic integration could be added, linking national legal land-use planning purposes to an abstract super-ontology allowing searches for

specific types of land-use purposes (potentially) across Europe (or smaller, coherent region).

Georama

We see that there is an apparent need for:

- The geodetic reference system and measurement units. Notice that in Greece we do not mainly use the WGS84 format and an initial transformation is needed there.
- Standardized legend at a minimum set (e.g. border of areas etc) for all authorities at all levels and for the needs of Plan4All portal
- Application processes for transformation of data models between different SDIs
- Common understanding for the development of interoperable network search services, because which is most important to discovery information! (Technical details: Discovery can be facilitated using imported information at the WSDL service description and using also semantic OWLS description on SDI network search services.

MEEDDM

- Semantic interoperability of the graphical expression of local spatial planning documents: agree on a mechanism enabling the description of the zoning system in each country with the main categories to be defined as the first level classification. (e.g. U, AU, N, A in the French context) The second level classification will be country dependant and will be linked to the textual description of the regulation
- Regulation interoperability: the textual description of what is allowed, restricted or forbidden in term of construction is not only country dependent but often municipally dependent. It is not realistic to achieve European harmonisation, where national one is not possible. The issue is then twofold:
    - Agree that the textual information be digital as a structured text
    - Provide “on the fly” translation so that foreigners, can get the overall essence of the regulation, details being obtained through local proxies.

Zemgale

In the frame work of the Norway grant project “Capacity Building of Zemgale Region for Strengthening the Economic Activities and Cooperation with Norwegian Institutions (Cooperation Agreement No. LV0056)” has been developed unified database for specification of graphical part – legend (common symbolisation).

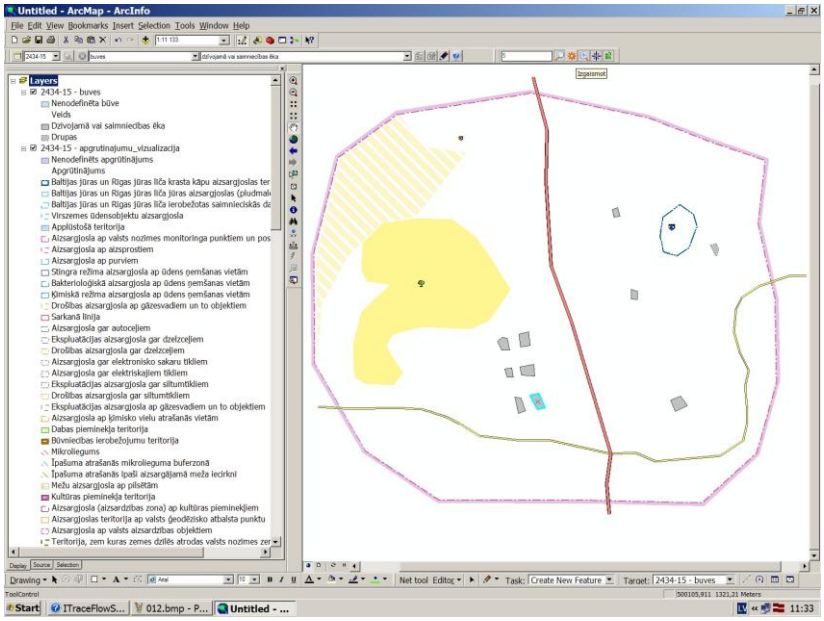


Figure 7: Unified database for specification of graphical part – legend

Infrastructure of geospatial information in the state is implemented step by step, stating for state administration the necessary geospatial data sets and assigning them to various levels of priorities, assigning the responsible institutions (data holders) for formation and maintenance of these data sets, step by step improving quality of already existing data sets and their mutual interoperability, as well as step by step creating new geospatial data sets. Register of geospatial data themes with responsible and jointly responsible ministries in formation and maintenance of these data was already worked out in interinstitutional work group about working out of national position regarding to INSPIRE directive and will report in senior officer meeting on March 13, 2006. **This data set register serves as base for further competence distribution among ministries and for assigning the responsible institutions within the framework of corresponding department.** For details see Zemgale case study.

3.3.2. Requirements and proposals on data models

MAC

The main requirement on interoperability is to move all of the relevant GI databases towards INSPIRE compliance, in line with Government policy.

The Department of Environment, Heritage and Local Government has identified the Irish INSPIRE datasets in broad terms, while the Irish INSPIRE Technical Subcommittee has identified the data themes in more detail, and the organisations responsible for them. That leaves the Local Authorities, and it is proposed to address these directly using a suitably structured tool.

As the INSPIRE architecture in inherently Web-based[1] and given the progress of the ISDE in Ireland, the preferable data model and data-flow in Ireland is a distributed architecture with a light central mediation service (like ISDE, the Irish Spatial Data Exchange[2]) based around OGC and ISO standards and INSPIRE compliance, which allows it to be independent of any catalogue implementation technologies.

The ISDE architecture consists of a number of components as shown in the diagram below. They are:

- Two browser versions exist, namely that developed by ESRI-Ireland and an open-source browser developed by Coastal and Marine Resources Centre (CMRC) at University College Cork (UCC)[3].
- The Messaging Hub, known as 'Reach Lite'. This is a temporary component being used while discussions are carried out with the Reach Agency on possible integration with the Irish Public Services Broker.
- The Broker/mediator. This maintains a record of record of participating catalogue services.

[1] See INSPIRE Technical Architecture – Overview, 05-11-2007, at www.compass.ie//inspire/INSPIRE_IRs/INSPIRETechnicalArchitectureOverview_v1.2.pdf

[2] See www.isde.ie

[3] http://cmrc.ucc.ie

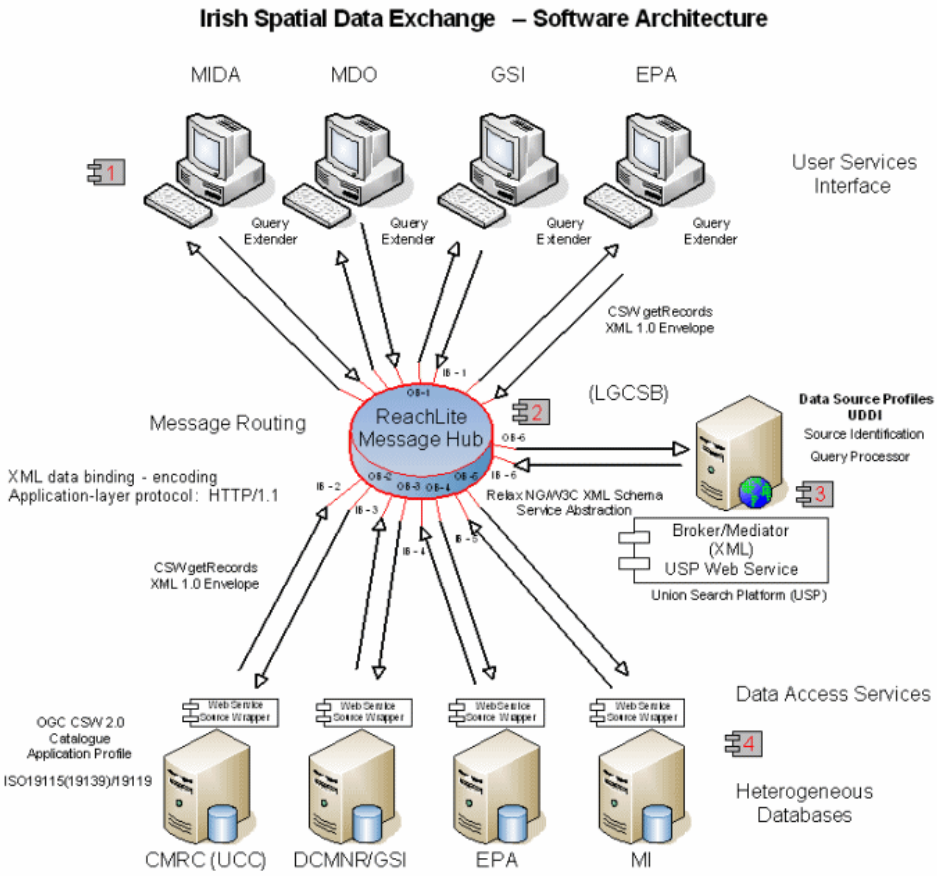


Figure 8: Irish spatial data exchange – Software Architecture

For this ISDE architecture a simplified version of the Irish Reach Public Service Broker protocols (ReachLite) was implemented[1]. This 'lite' implementation of protocols circumvented the more complex requirements for a complete hub-and-spoke implementation. The solution included:

- Web Browser (Requester) – The user of the service via the host application server
- Web Server (Application Host) – The Enabler that manages the web services and accepts HTTP requests and augments and routes the message appropriately
- ReachLite (Fulfiller) – The provider of the service functionality based on a partial implementation of the Reach Public Service Broker interface standards.

The ReachLite Fulfiller was designed with software components to work both in a Microsoft and Open Source environments. The ISDE solution demonstrates the value of data exchange within the public services sector as a whole. It provides immediate practical assistance to those agencies and organisations and individuals that require an Irish nation wide-view of the available data.

The key focus of the ISDE project was the development of a metadata discovery mechanism that allows metadata catalogues held by the different organisations to become searchable via the Web. In collaboration with ESRI Ireland, Fujitsu developed and deployed an online mechanism whereby publicly funded bodies can provide seamless public access to Metadata relating to GI data sets that they hold. They also identified suitable standards for Metadata exchange in the context of metadata catalogues and indexed data stores, and migration towards INSPIRE compliance.

[1] See www.fujitsu.com/ie/casestudies/midata.html

By maximising the reuse of GI data using a federated database integrated using web technologies, the key benefits are the improved selection of research locations, topics and questions to be answered about Ireland's resources. The ISDE project has also increased Ireland's ability to manage and benefit from the various data resource that exists within the public services and is demonstrating the potential of web-enabled Geographical Information Systems (GIS) and related technologies at a national level.

It is hoped that the successful sharing of metadata will demonstrate the usefulness of the Irish Spatial Data Exchange and prompt other organisations to make funding available to allow all INSPIRE-related data from various repositories to be similarly exchanged seamlessly.

Olomouc

Preferred data model

We prefer the "HKH" DM (see the attachment of the Olomouc case study) that should be updated. Its usage is expected also at the regional level, which is coordinated by the Regional Authority of the Olomouc region.

For the spatial planning DMs used at the local level in the Czech Republic to be connectable, we expect their extension by the column identifying the Topic for a particular phenomenon (class of elements). The list of topics should be identical for all participants of the Plan4All project. Inclusion of each of the local DM phenomena to the Topics would enable the semantic translators to accomplish appropriate transformation into the DM P4A, also in the real time.

Basic list of phenomena that is specified in the manual of the amendment no.1A of the Act no.500/2006 Coll. on planning analytical materials, planning documentation and the way of the planning activity evidence is mandatory for the geospatial data in the Czech Republic. For creation of the list of Topics, it is possible to group the mandatory phenomena into several general categories. The opposite approach – i.e.division of the mandatory phenomena into more detailed or semantically different categories – is not possible for legal reasons!

Dataflow

This scheme describes the basic processes associated with the distribution and accessibility of geospatial data.

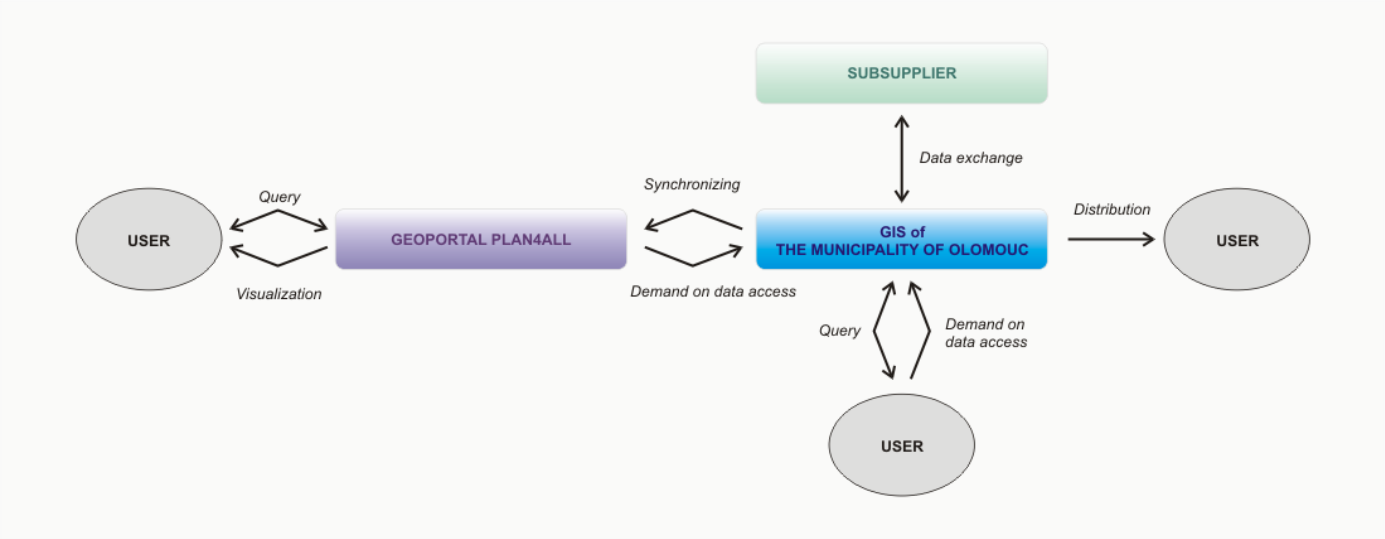


Figure 9: Data flow diagram of zero level

Inquiry

A user gets the metainformation about the available data sources via attribute and spatial inquiries.

Visualization

Visualization tools of the PlanAll portal provide cleraly organized graphic output with minimal data content, which is suggested in chapter 2.2.1.

Geospatial Plan4All portal

It represents an entry point to the extensive data sources administered by the project participants. Thanks to the metainformation catalogue and the geospatial data saved on the server, a user will get information about the way to get to these sources.

Distribution

Local map services or administrative device provides the authorized users with data and information via text, graphic, analog or digital outputs.

Synchronization

Plan4All portal is updated by the metadata or references on geospatial data of the Olomouc City Council.

Data exchange

The third parties that participate in the geospatial data creation, provide their own data, or potentially get the referencial data from the City Council. These relations should be defined in the business model.

LGV

The data specifications should follow the structure of "ISO 19131 Geographic information - Data product specifications" standard. They include the technical documentation of the application schema, the spatial object types with their properties, and other specifics of the spatial data themes using natural language as well as a formal conceptual schema language.

Using international standards like the "Uniform Modelling Language" (UML) for the data model. Using UML diagrams, an XML (GML) -schema file has been generated automatically using software tools. A GML-based data model realizes the paradigm of „separation of (semantic) content and (graphical) representation". This means that a digital version of a spatial plan mainly contains information on the semantic content of a plan, i. e. the regulations on possible or impossible land-use in different regions of the planning area. The information how this content is actually presented on a computer display or in a printed plan is specified independently from a concrete plan in a separate stylesheet document.

A Plan4allGML schema could have a three-level structure:

On the upper level there are GML feature types for plans, representing a spatial plan as a whole. All plan types are derived from the basic class LandUse_Plan. The basic class has a number of attributes, allowing e.g. the specification of the plan's identifier, name, number and description, of company and person responsible for generating the plan, and of important dates concerning the planning process.

The polygonal geometry of the planning area can also be specified. Planning regulations which cannot be formalized or have no spatial reference can be formulated textually.
A plan aggregates a number of plan sectors, either corresponding to partial plans (e.g. infrastructure plans, green area plans, etc.), or to spatial (horizontal or vertical) partitions of the planning area. The basic class for plan areas is LandUse_PlanSector.

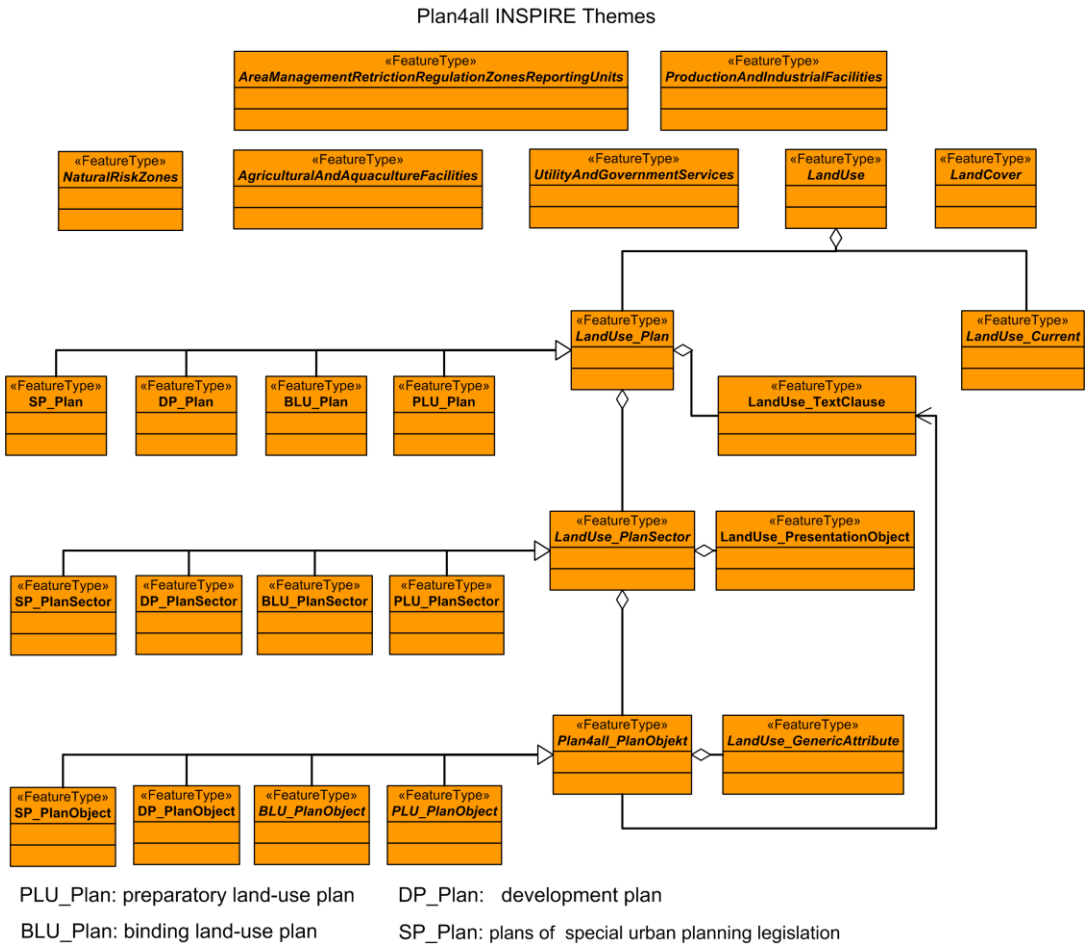


Figure 10: Basic structure of a Plan4all GML data model

A plan sector aggregates an arbitrary number of plan objects, each of them corresponding to a specific regulation (e.g. building development area, communal infrastructure area, regulation line….). Figure 11 shows the inheritance hierarchy of the GML feature types modelling specific regulations of a binding land use plan. Each binding land use plan object is derived from one of the following classes:

- BLU_PointObject: Basic class for regulation with point-shaped spatial reference;
- BLU_LineObject: Basic class for regulation with line-shaped spatial reference;
- BLU_PrimaryAreaObject, BLU_OvelayAreaObject: Basic classes for regulations with polygonal-shaped spatial reference.

There are two possibilites for the definition of objects with polygonal-shaped geometry. PrimaryAreaObjects (derived from BLU_PrimaryAreaObject) cover the whole planning region without overlap. Balancing of areas is possible among these objects. OverlayObjects (derived from BLU_OvelayAreaObject) superimpose PrimaryAreaObjects, and normally are not apt for area balancing.

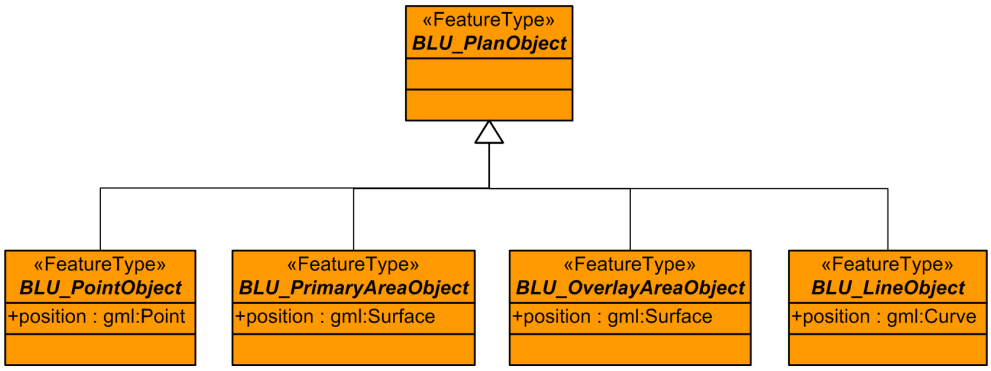


Figure 11: Structure of a Plan4all GML application schema

The specific content and meaning of the regulation is formally represented by the attributes of the corresponding plan object. If a complete formalization of a regulation is not possible by means of feature types and attributes, it can additionally be expressed as textual regulation associated with the spatial object. Because the content of spatial plans is not totally pre-assigned, the feature catalogue and the GML schema have to be open and extensible. This is accomplished by a set of "generic" feature types, by "generic attributes" extending the set of specific attributes of each feature type, and specific text attributes extending the range of enumeration values

PROVROMA

It is necessary to point out how important is the need for distinction of data model, that is between thematisms owning provincial planning tools and thematisms incorporated by other instruments also on an higher level (compatibility between Plan Province and Plan Region together with binding constraint). It is suggested to adopt a structure with thematism progressive levels regarding the planning tool based on the model of Corine Land Cover for greater compatibility with lower-and higher-level tools.
(compatibility between PTPG and PUC).

Province of Rome standard will be fully coherent with directive INSPIRE principles and is going to be used for first experimentation of planning spatial database.
The logical model of the DBT will be articulated in 5-6 geographic layers, each one focusing a specific theme (i.e. “environment”, “settlements”, etc.).
Each layer will contain specific topics in order to further categorize the contained data (i.e. the layer “Ecological System - Province”, has the sub-topics “Primary component”, “Secondary component” and “Agricoltural Areas”).
Each topic is structured in classes (i.e.: the “Primary component” topic contains the classes “Core Areas”, “Buffer Areas”, etc.).
Lastly, each class has attributes that specifies the properties (i.e in the class “Core Areas” attributes “type” and “type_ boundary” are defined).
Management and up-dating of spatial planning data is to be based on the property “Data Owner – Administration”. The basic idea is that planning spatial data that are to be included in a plan, depending on a specific Administration, must be managed – in the DBT – as dynamic spatial links to external source. For instance “Protected Natural Areas – State” that the Province Land Coordination Plan must consider by law (existing or programmed) will be treated as an external reference.
Dataflow clearing is deeply concerned with administrative competence clearing.

Avinet

The Plan4All data model must be capable of representing planning datasets consisting of point, line and polygon features:

- Each dataset should have associated metadata
- Each feature may have varying attributes associated with it
- Each feature may have more than one legal planning category associated with it

It is not a requirement that a dataset should contain multiple geometry types.

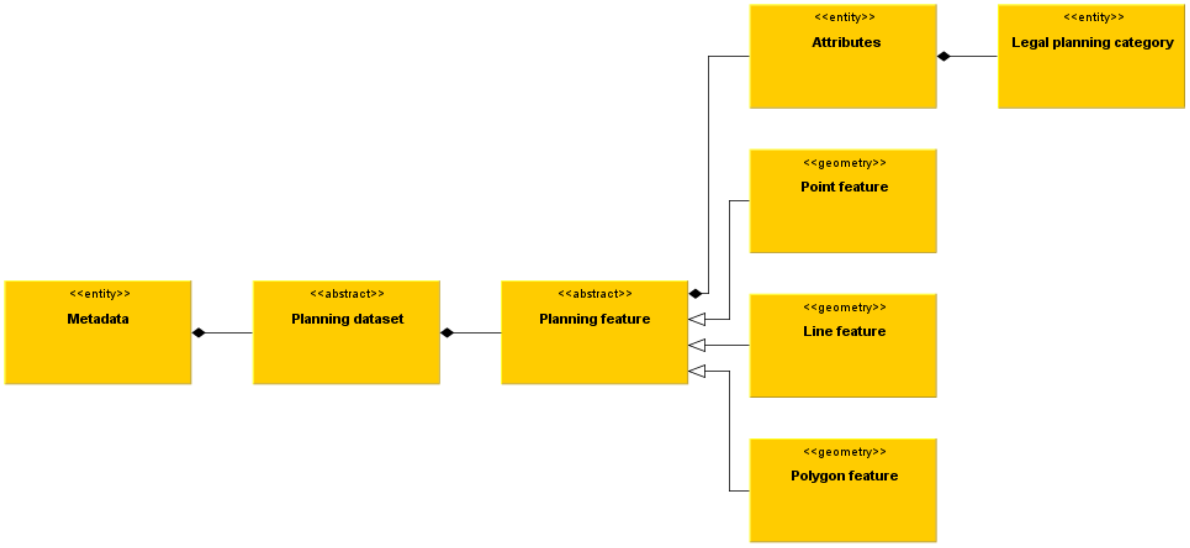


Figure 12: Data model proposed by Avinet

Requirements on visual presentation

The planning data are expressed as a number of thematic point, line and polygon layers combined in a specific order to render a standardized visual representation.

The two diagrams below show proposed drawing / colour representation rules for planning purposes as defined in overview and detailed plans.

Figure 13: Diagram1 with proposed drawing

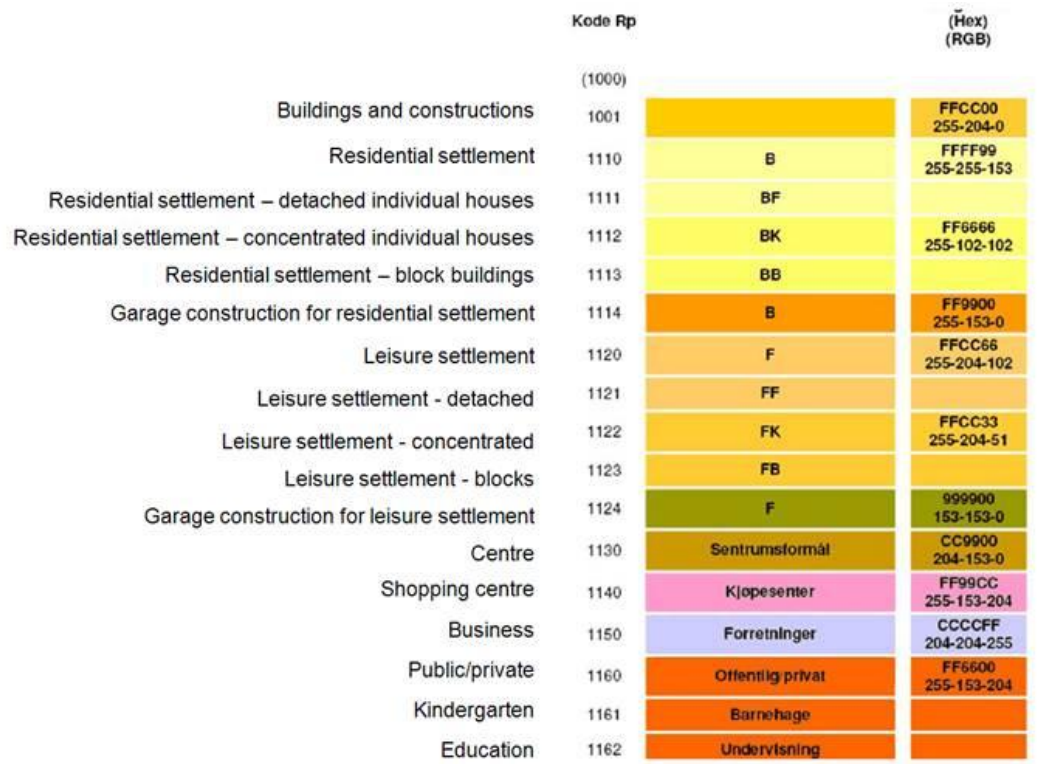


Figure 14: Diagram2 with proposed drawing

MEEDDM

Based on the theoretical structure, a meta-data model is proposed underneath:

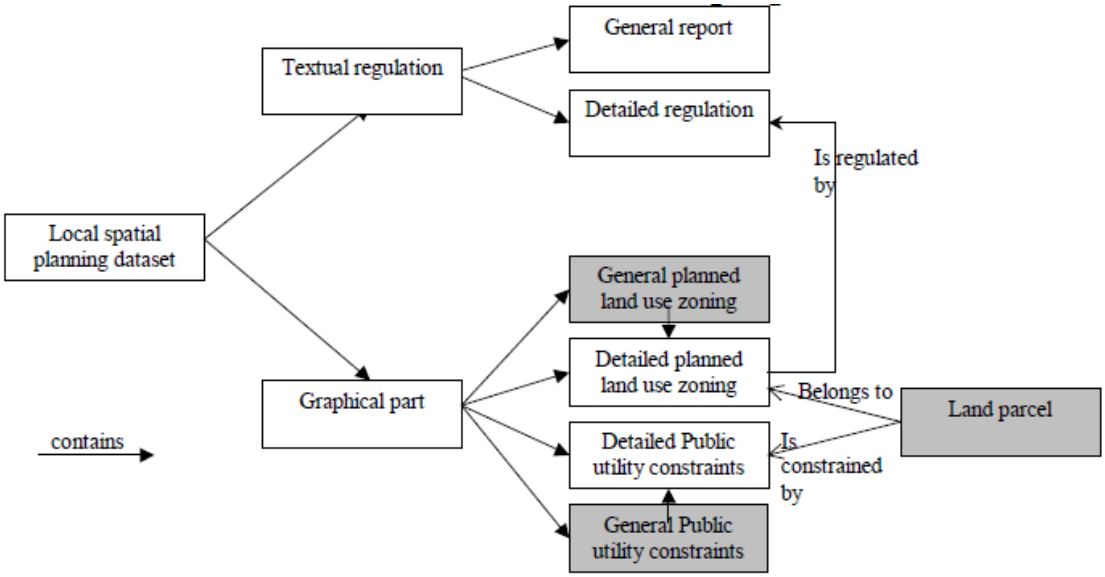


Figure 15: Meta-data model proposed by MEEDDM

The data flow may have two mechanisms:

- The country/municipal dependent data (in white)
  - For these elements, the dataflow must describes
    - the structure of the information
    - the information itself
    - an "on the fly translation service" (as text must be intelligible whatever the user spoken language is)
- The European standardised data (in grey)
  - For these element a European standard may be devised as a candidate for annex 3 relevant themes
  - The Land Parcel standard to be used is the INSPIRE annex1 relevant standard

3.3.3. Requirements and proposal on data set

LGV

Spatial data theme "Land use":

Planning elements of state spatial and regional planning

- Spatial categories:
  - Conurbations/agglomerations
  - Regulatory areas
  - Structurally weak areas
  - Rural areas

- Central place systems:
  - Basic centres
  - Middle-order centres
  - High-order centres

- Axes:
  - Supra-local axes or communication axes serve the far-reaching exchange of goods, services and people
  - Settlement axes provide for the linear concentration of settlements in coordination with public transport systems

- Functions:
  - Central place functions
  - Commerce and industry
  - Services
  - Housing
  - Nature conservation and landscape management
  - Agriculture
  - Forestry
  - Water management
  - Clean air and climate
  - Tourism, leisure, and recreation
  - Raw materials

- Guideline values

Planning elements in local urban land-use planning

Local urban land-use planning can be subdivided into preparatory, binding land-use planning and plans of special urban planning legislation.

Elements of preparatory land-use plans:

- General types of use:
  - Residential
  - Mixed

    - Industrial and commercial
    - Special uses
- Facilities and infrastructure for the public and private provision of goods and services, in particular facilities serving the community such as schools, churches, and health, cultural, and social facilities
- Land for supra-local and local transport
- Land for utilities
- Green and open spaces, sports and recreation areas
- Areas where uses are restricted on environmental protection grounds
- Waterbodies, ports and harbours, as well as areas for water management, flood control, and drainage
- Areas for filling, excavation, and the extraction of mineral resources
- Agricultural land, forest and woodland areas
- Areas for measures to protect, preserve, and develop the natural environment and landscape

Elements of binding land-use plans:

- Specific types of use intensity of built use:
    - Small holdings
    - Purely residential areas
    - General residential areas
    - Special residential areas
    - Village areas
    - Mixed areas
    - Centre zone
    - Commercial areas
    - Industrial areas
    - Special areas
- Intensity of built use:
    - The site occupancy index
    - The floor-space index or floor area, the cubing ratio, or building volume
    - The number of full storeys
    - The height of physical structures
- Building method and design:
    - Open coverage type
    - Closed coverage type
    - Divergent coverage type
- Positioning of physical structures:
    - Building lines
    - Set-back lines
    - Coverage depths
- Land for ancillary structures (e.g. parking pace, garage)
- Traffic areas and special purpose traffic areas
- Service areas
- Areas for waste disposal and drainage, including the retention and seepage of rainwater
- Public and private green spaces
- Waterbodies
- Agricultural and forest areas

- Incineration bans and the use of renewable energies
- Protected areas and pollution control
- Planting and care of trees, shrubs and greenery of any other kind
- The setting of time-limits and conditions for designations on special urban development grounds

Plans of special urban planning legislation

- Scope of
    - Redevelopment areas,
    - Urban development measure,
    - Socially Integrative City areas,
    - Business improvement district,
    - Housing improvement district.

Spatial data theme "Area management/restriction/regulation zones and reporting units":

- Water retention areas
- Noise protection area
- Noise abatement plan
- Clean air plan
-

Spatial data theme "Natural risk zones":

- Flooding area with a high probability (likely return period, once every 10 years)
- Flooding area with a medium probability (likely return period, once every 100 years areas with high damage potential and consequent building restrictions for these areas)
- Flooding area with a low probability (extreme events)

PROVROMA

The Province of Rome - as holder Administration for coordination land planning – is going to select a group of simple data levels to be shared as minimum data set for geographic data files interoperability as well as land and urban plans (i.e. vertical and horizontal) harmonization.
The table below is to exemplify the concept. Reference scale is 1:5.000 – even for lower scale outputs – according to standard cartography precision accuracy.
The three black text fields are the minimum data set. The gray text field is the first level for possible custom data set. In the blue text field the owner Administration for each layers identified.

Table 8: Minimum Data Set – An example for Province Level land Planning

2.2.1. Minimum Data Set - An Example for Province Level Land Planning

Lev01	Lev02	Lev03	Lev04	Data Owner - Administration
Minimum Data Set			Custom Data Set	
Environment	Ecological System - Province	Primary Component	Core Areas	Province
			Buffer Areas	Province
			Primary Connection Areas	Province
		Secondary Component	Protected Agricoltural Areas	Province
			Discontinuity Elements	Province
		Agricoltural Areas	-	Province
	Protected Natural Areas	Protected Natural Area - State	Existing	State
			Programmed	State
			Proposal (Extension)	Province
		Protected Natural Area - Region	Existing	Region
			Programmed	Region
			Proposal (Extension)	Province
		Protected Natural Area - Province	Existing	Province
			Programmed	Province
			Proposal (Extension)	Province
		SIC	-	EU
		ZPS	-	EU
Settlements	Urban Settlements	Complex Urban Areas - Conurbation	-	Province
		Complex Urban Areas - Polycentric	-	Province
		Elementary Urban Areas	-	Province
		Isolated Urban Cores	-	Province
		Nuclear Centralized Settlements	-	Province
		Nuclear Linear Settlements	-	Province
	Functional Settlements	Metropolitan Strategic Functions	Business, Research and Development, Leisure	Province
			Intercommunal Parks	Province
			Specialised Areas	Province
		Metropolitan Productive Functions	Production, Distribution and Commerce	Province
			Production Parks	Province
			Specialised Areas	Province
		General Services (Province e Inter-Municipality)	-	State, Region, Province
Transport	Railway Network	National - High Capability	Existing	State
			Programmed	State
		National - Regional e Interregional	Existing	Region
			Programmed	Region
		Private grant	Existing	Region
			Programmed	Region
		Metropolitan Urban Network	Existing	Region
			Programmed	Region
	Road Network	Continental and National Network	Existing	State
			Programmed	State
		Region - 1st Level	Existing	Region
			Programmed	Region
		Region - 2nd Level	Existing	Region
			Programmed	Region
		Province and Municipality - Local	Existing	Province
			Programmed	Province
		Panoramic Landscape	Existing	Province
			Programmed	Province

Avinet

The chosen data model needs to be flexible enough to handle both the data types and the thematic grouping of basemaps.

Small and intermediate scale datasets in Norway ((N5 -) N50 – N5000) follows this division of themes:

- Terrain
- Land cover
- Communication infrastructure
- Geographical names
- Buildings and constructions
- Administrative borders

Detailed national spatial datasets in Norway (FKB A-D) follows this division of themes:

- Terrain
  - Contour lines
  - Digital terrain model
- Hydrography
  - Coast
  - Lake
  - River
- Land cover
- Buildings and constructions
  - Buildings
  - Works
  - Address
  - Pipelines
  - Telecommunications
  - Land use
  - Nature information
  - Geodetic reference points
  - Roads
  - Road network
  - Railroad
  - Airports
- Property
- Restrictions
  - Cultural heritage
  - Nature protection

Planning data in Norway follows the following thematic grouping:

- Buildings and constructions
- Communication and technical infrastructure
- Green areas
- Defence
- Agriculture, nature and recreational areas
- Use and protection of sea, lake and rivers

MEEDDM

The minimum data set for the standardisation process must firstly conform to the same structure. From a theoretical point of view, the local spatial planning documents have the following structure:

- The textual regulation document
  - The general report expressing the overall objective of the development plan for the municipality (in France the “projet d'aménagement et de développement durable »).
  - The regulation that defines the rules and the land-use constraints in consistency with the general report, enabling to reach the development objectives.

- The graphical part
    - The general “planned land-use” map providing the zoning of the municipality according to the main categories (e.g. U, AU, N, A)
    - The detailed “planned land-use” map enabling to tell which part of the regulation applies to each location
    - The general “public utility constraints” providing the zones where a constraint applies but giving no information on which type of constraints applies
    - The detailed “public utility constraints” giving the detail of which constraint applies

3.3.4. Requirements and proposals on metadata

Olomouc

Metadata transfer according to INSPIRE
Within the Plan4all project, we intend to transfer metadata into the structure according to the INSPIRE implementation rules, which are based on the ISO standards no.19115 and 19119. We want to treat these standards as the basic framework for metadata logging, and we suggest the extension by new elements to the extent mentioned below. The changes are highlighted in colour (innovation, commentary) and an appropriate commentary is added.

`Olomouc example` (This data set does not exist. This is a test entry. All the contact details are fictional!)

```
  + Part B 1.3 Resource Type: data set
  + (New) Spatial representation type: vector
  + (New) Data format: dgn
  + (New) Format version: V7
  + (New) Reference system: S-JTSK
  + (New) Character set: utf-8

+ (New) Distribution info:
  + (New) Data format: dgn, shp
  + (New) Format version: V7, V8
  + (New) Reference system: S-JTSK, WGS84
  + (New) Character set: utf-8, win-1250
  + (New) Medium: DVD, WMS, WFS

+ Part B 2 Classification of data and services:
  + Part B 2.1 Topic category: natural hazards
  + Part B 2.1 Topic category: conservation <Categories should be embedded
into the code list. Data should correspond with the categories listed in
the unified Plan4All data model via which the semantic mapping of the
phenomena unifying the data models should happen. Standardized code lists
should be translated also into Czech language.>

+ Part B 4 Geographic Location:
  + Part B 4.1 Bounding Box:
    + (New) Reference system: S-JTSK
      + West: 17.006397
      + East: 17.698035
      + North: 49.436652
      + South: 49.770088
  + (New) Altitude: Baltic after levelling (Bal)
  + (New) Spatial description: Cadastral territory of the Olomouc City,
processed except the Bystřička area.

+ Part B 5 Temporal Reference:
  + Part B 5.4 Date of creation: 2008-12-02
  + (New) Update period: Annual

+ Part B 6 Quality and validity:
  + Part B 6.2 Spatial Resolution: 1:10000 to 1:25000
  + (New) Obligation: authorized mandatory data

+ Part B 7 Conformity id="Conformity_001 (INSPIRE)" :
  + Part B 7.1 Specification:
    + title: Service Abstract Test Suite
    + publication date: 2007-11-21
  + Part B 7.2 Degree: True
```

```
+ (New Part) Copyright:
  + Responsible party:
    + organisation: Povodí Moravy, s.p.
    + person: Karel Hastrman
    + adress: Dřevařská 11, 601 75 Brno
    + e-mail: povodne@pmo.eu
    + phone: +420 541 123 456
    + web: http://pmo.eu
  + Responsible party role: author

+ Part B 10 Metadata on metadata:
  + Part B 10.1 Metadata point of contact:
  + (New) Character set: utf-8
  + (New) File identifier: 123-mmol-2009
```

Extension of metadata specification by copyright

One of the main requirements on the extension of metadata entry is to introduce an item for copyright definition, thus specification of the person (legal or physical) who practises the appropriate copyright of the data sets or map service.

Metadata availability

At the level of the technical solution, we suggest we should selectively modify the extent of the displayed metadata (elements) according to the user groups. We follow the real needs of the typical user groups, by which we want to achieve higher user comfort for them.

MAC

The UK GEMINI2 (GEMINI version 2.0 final) metadata specification has been recently officially published[1]. It specifies a core set of metadata elements for use in a geospatial discovery metadata service, e.g. the UK's national SDI initiative. The first version GEMINI, (ver 1.0) was published in 2004 and is used in the Gigateway[2] metadata service. GEMINI2 is a revised version, meeting the requirements of the INSPIRE metadata Implementing Rules, and conforming to the international metadata standard for geographic information, ISO 19115. It is intended for use in a future UK geospatial discovery metadata service. It has been published following a period of public consultation and can be downloaded for free.

For the GEMINI2 revision, the following principles were followed:

- To meet the requirements for metadata of the EU INSPIRE Directive – where an element is mandatory in the INSPIRE Implementing Rules, it is included in UK GEMINI with the same domain and occurrence, but the element name and description may be different in order to maintain compatibility with the previous version of GEMINI and to provide greater clarity
- To be conformant with the International Standard ISO 19115 Geographic information – Metadata, within the limits of the requirements of INSPIRE
- To be consistent with the GEMINI 1.0 where possible
- To be compatible with the e-Government Metadata Standard (eGMS) where possible
- To correct errors in GEMINI 1.0 and take into account experience of its use.

[1] www.gigateway.org.uk/metadata/pdf/GEMINI2.pdf

[2] See www.gigateway.org.uk

The UK's Gigateway national geoportal metadata editor, MetaGenie[1], is not yet GEMINI2 compliant, and thus not (yet) INSPIRE compliant. They are seeking funding to change MetaGenie to fully reflect GEMIN2 'sometime soon'. It is important to note that GEMINI2 is also compatible with the UK's eGovernment Metadata Standard (eGMS)[2], which is mainly a slightly extended profile of Dublin Core.

PROVROMA

The standard that is specified in the table (Core metadata - Guidelines for the implementation of the ISO19115 standard" of National Technical Committee for the Coordination of computer spatial data" formed within CNIPA).
It is planned to make the switch from the standard current to the CNIPA standard by the end of the project in progress .

Core Metadata is the following:

Metadata Information			
1	Metadata File Identifier (M)		
2	Metadata Language (M)		
3	Metadata Characterset (C)		
4	Metadata Parent Identifier (M)		
5	HierarchyLevel (M)		
6	Contact (M)	Contact Name (M)	
		Role (M)	
		Contact Information (M)	web site (C)
			Telephone (C)
7	Date Stamp (M)		
8	Metadata Standard Name (M)		
9	Metadata Standard Version (M)		
10	Metadata use limitation (Op)		
	Metadata constraints access (Op)		
	Metadata constraints usability(Op)		
	Other metadata constraints (C)		
Data Identification			
11	Title (M)		
	Data (M)	Data (M)	
		Data type (M)	
	Data Responsible (O)	Responsible Name (M)	
		Role (M)	
		Contact Information (M)	web site (C)
			Telephone (C)
	Data type (M)		
	Other details (Op)		
12	Description (M)		
13	Keyword (M)	Keyword (M)	
		Thesaurus (M)	
14	Point Of Contact (M)	Name (M)	
		Role (M)	
		Contact Information (M)	web site (C)
			Telephone (C)
15	Spatial representation type (C)		
16	Data spatial resolution (M)	Equivalent Scale (C)	

[1] www.gigateway.org.uk/metadata/metagenie.html
[2] See www.govtalk.gov.uk/documents/eGMS%20version%203_1.pdf

		Distance (C)	
17	Data Language (M)		
18	Data characterset (C)		
19	Theme (M)		
20	Data geographic localization (M)	westBoundLongitude (M)	
		eastBoundLongitude (M)	
		southBoundLatitude (M)	
		northBoundLatitude (M)	
	Vertical extension (Op)	height min (M)	
		height max (M)	
		Measure unit (M)	
		Vertical Datum (M)	
21	Further information (Op)		
22	Graphical example (Op)		
Data constrains information			
23	Data use limitation (M)		
24	Data constraints access (M)		
25	Data constraints usability (M)		
26	Other data constraints (C)		
Data quality information			
27	Quality level (M)		
28	Data quality (positional accuracy) (C)	Measure unit (M)	
		Value (M)	
Data Information about lineage and production process			
29	Data Lineage – Production Process (M)		
Reference System Information			
30	**Spatial Reference System** M)		
Distribution Information			
31	Distribution format (M)	Format Name (M)	
		Format Version (M)	
32	Distributor (M)	Name (M)	
		Role (M)	
		Contact Information (M)	Web Site (C)
			Telephone (C)

M: Mandatory – Op: Optional – C: Conditional

TDF/ZEMGALE

There is no metadata standard in Latvia yet. In Zemgale and TDF are currently implemented metadata based on ISNPIRE profile.

Technical Metadata:

- Direct referencing – physical location and data schema/structure
- Data currency/status – version, time, stamping
- Accreditation/Assess permissions – Ownership
- Query time/Governance – data volume, no. of records, access paths

Contextual Metadata:

- Logical referencing physical data – semantic/syntactic anthologies
- Lexical translation – Thesaurus, ontological mapping
- Named derivations (summarizations)

Scope of Requirements:

- All involved partners
- Related to provenance

Data Versioning:

- Distinguish latest/agreed versions of data

- Maintain history record of change
- Synchronize and mirror replicated data
- Distinguish shared personal interpretations and/o annotations

Provenance

- Record of data processing – calibration, filtering, transformation
- Record of workflow – methods, standards and protocols
- Reasoning – evidential justification for inferences & conclusions

Scope of Requirements

- All involved Partners
- Includes Technical and Contextual Metadata

3.3.5. Ideas regarding DRM

Olomouc

We attempt to disclose the metadata about spatial planning data and the basic geospatial data to all mentioned target groups also at the Plan4All portal. We do not have any fundamental requirements on protection of these data because they should be meant for the general public.
The way of geospatial data distribution and their handing over to the final users depends on the current Building Act and the Copyright. The national legislative framework in concerned. From this reason, we do not see the importance of the DRM establishment until this national level.
DRM tools are related to the outputs mentioned below. By each of them, only the options of DRM tools (Rights, Restrictions, Obligations Rights owners) that have not been applied yet because of absence of the sufficient GIS solution, are listed.

	Rights	Restrictions	Obligations	Right Owner
Editable geospatial planning data	• preview • edit • export into other formats • print only for one's own needs	• limited for the area of the processed project • limited for the time of project realization	• paid service (for users out of the Civil Service Authorities and Local Authorities) • registration • electronic request	• the Olomouc City Council • planning engineers and city planners • students • anonyms
WMS map service and thin client of the map server	• preview • redlining • print only for non-commercial purposes with mentioning the source	• limited for the data layers • area-limited	• free of charge • mandatory registration	• Spatial planning authorities • Building authorities • other Civil Service Authorities • Firms • NGO • Investors, real estates owners • Real estate agents • Public • Students
WFS map service	• preview • edit • export into other formats • print only for one's own needs	• limited for the data layers • limited for the area of the processed project • limited for the time of project realization	• free of charge • electronic request	• the Olomouc City Council • planning engineers and city planners
Commercial part of the map server - web-based thin client	• preview • print only for one's own needs	• limited for the area of the processed project • limited for the time of project realization	• payment	• real estate agents • investors and real estate owners
Metadata	• preview • print • export	• none	• none	• anonym

Zemgale/TDF

We attempt to disclose the metadata about spatial planning data and the basic geospatial data to all mentioned target groups also at the Plan4All portal. The way of geospatial data distribution and their handing over to the final users depends on the current national legislative framework.

4. Bottlenecks

Description of potential problems with realization of the Plan4all tasks

There are varied situations regarding spatial planning data in different European countries. The main potential problems and risks referred by partners are listed below:

- Creation of the common SDI in national level is ongoing and sometimes it is unavailable for project partners
- Local governments are free to manage themselves in some countries, they are not forced to comply to any standard unless a law decides otherwise
- The procedure that will produce the description of Annex III themes is not yet finalised. Experience from the procedure of Annex I themes enable to draw some trends
    - Representative bodies from the theme will probably be tasked to submit draft theme descriptions. It is likely that ISOCARP (for the spatial planning) and EUROGI (for the GI aspects) may be selected to submit drafts. Plan4all may elaborate one, then endorsed by ISOCARP and EUROGI
    - No drafting team may be created but INSPIRE method for specifying themes will be required for the drafting methodology.
    - A sound balance between detailed data specification and simple data model is required.
    - The procedure for adopting implementation rules is comitology described at article 22 of the INSPIRE directive. Decisions are voted on using the qualified majority system. It means that if the implementation rules are too expensive to follow, a no vote may result. As far as Annex III theme 4 and 6 is concerned, and due to the high variation in spatial planning documents between the European countries and inside some countries, it is likely that a too constraining data model will be rejected. The proposed solution (see 2.2.2) might be a way forward to achieve consensus in the INPIRE context.
- Data providers need to be stimulated to contribute data and metadata into the system, otherwise they fail to contribute their part
- An obstacle is to gain hold of data which are similarly well updated as those a user would be able to get by contacting the municipal planning engineer. The business processes are not sufficiently well integrated in the municipalities to ensure that planning data immediately are propagated into open services as soon as a new plan has been approved. The time-lag from a new plan has come into effect until it is available on the Internet is some times significant.
- By constructing the spatial planning data infrastructure, mutual consensuses for accomplishment of the fundamental goals could be a risk. E.g., it would be difficult to abstract the specific requirements from particular regions and levels into the unified conception of geoinformation infrastructure. Therefore we prefer such an access to data harmonization and interoperability creation that is primarily based on unifying processes (semantic translators) proceeding in real time above the specific and subjectively created data of the project Plan4All participants. According to us, it is not possible to remove the local specifics, which are within individual country enabled by the current legislation, because of the hectic globalization. We need to make some modifications that can unify geospatial planning data across the regions according to the established rules.
- Bottlenecks of GI data

    - Accessibility:
        - Identification of data providers and data types
        - Cost
        - Ownership constraints
        - Confidentiality
    - Quality:
        - Metadata
    - Time
        - Duplication of effort (e.g. by 2 government departments)
- Local Authorities do not have staff to implement the GIS applications as quickly as more advanced Local Authorities; an integrated INSPIRE-compliant SDI cannot exist, until all Local Authorities contribute to the infrastructure's development equally. Many Local Authorities appreciate that they will be required to meet the requirements of the INSPIRE and PSI Directives, but do not know what they are, how to do them or even appreciate the value of doing so (especially in the current strained economic circumstances)
- Many planners insist on using paper maps and technicians who create maps using software, without adding metadata of any sort.
- Not interoperable software
- The copyright practices, which restricts Local Authorities from publishing base map data on the web is a significant tension
- The quality of service and data provided by data suppliers
- Tension is present between the Local Authorities and the regional/national authorities because of responsibility for data or new SW/HW equipment
- The benefit of contribution to an ISDI and INSPIRE compliance is not seeing for participants

5. Results

General requirements

Studies show differences among individual countries in existing information systems and also in concepts of the future development. Partners from countries having some experience with an introduction of the information systems are able to specify their topics and requirements for future development in contrast to several countries standing only at the crossroad.
In this case, experience of the surrounding countries could be valuable article by the introduction of new technologies which may significantly facilitate the next development in the area of territorial planning.
User requirements are logically different in individual countries also according to the specific group of users, current habits in the each country and according to possibilities of infrastructure.
We can specify the common requirements for all partners as follows:

- Vertical and horizontal interoperability – tools and methods are not exactly defined and should be solved at least partly within the project
- Possibility to use maximum of established data models together with ensuring interoperability
- Visualisation INSPIRE annex III compliant land use data sets as a SLD/SE Web Map Service
- Possibility of publishing own data through web services
- Possibility to use web services from other data providers
- Definition of a minimal model for presentation of spatial data - legend
- INSPIRE compliance
- Possibility of metadata profile extension
- Geodata management covered geo-databases and files
- Possibility to display data without IPR restrictions, free access to spatial planning data
- Make physical data accessible in electronic format together with ensuring of DRM
- Use UML for describing the data model

Although it is not directly specified in case studies, the project should cover also:

- Explanatory dictionary for spatial planning (glossary)
- Multilingual Thesaurus for spatial planning
- Referential geographical system and projection
- Description of data transformation process
- Tools for data transformation

Spatial planning data

Results from the case studies analysis shows that many different data formats are used for data planning purpose. The most the most widespread vector data format is SHP, also CAD formats (DWG, DGN) are very often used. The different data formats go hand in hand with different data models, diverse methods of data storing and displaying and also with variant data flow processes. This is a risk for establishment of the new data models providing publication of spatial planning data from different data sources. Because the source data are

relevant to national geographical reference systems and projections, the Plan4all project should solve the transformation processes for a possibility to combine data from different data sources.

Also raster data are used in different formats, the most often used raster data formats are TIFF and JPEG. Utilization of different data formats does not bring a big problem for publication, because the data is used in the formats supported by most of SW products. Nevertheless, the problem is that the data is available in a national geographical coordination systems and projections. While the vector data may be relatively easily transform to another coordination system/projection without any important change of content, the same process causes an image distortion of the raster data. So if we need to get together raster data with different geographical system/projection, the final output would be unacceptable.
Some raster data used in spatial planning has no geographical reference at all. In the fact, that is only a scanned image of spatial data plan that may be put for example on the website of local/regional authority. Users can download and look at it, but this data format means zero data usability in other geographical information systems.

Only a few partners store the spatial data into databases, but most of them would like to do it. Databases for spatial data mean a trend and we may suppose dynamic progress in future of this style of data saving. Currently, ArcSDI, PostgreSQL/PostGIS or Oracle are used in the most cases. An access to data in different databases is one from the most important project tasks.

Some European countries are still only beginning to digitalize spatial planning data. They have little spatial planning data or data in low quality generated without any conception or standards. The Plan4all project should recommend a structure and data format which enables the creation of data without necessity to modify it again for Plan4all publication purposes.

Data sets available for tests and publication within Plan4all project are listed in Annex 1 of this report.

Standards and regulatory framework

There is a big difference among project countries in the implementation of a standardization process for spatial data. Some countries have not started to work with standards for spatial planning data, most countries are developing and modifying models and rules. Generally, the partners have accented in their case studies mainly:

- INSPIRE rules
- implementation of the standards ISO 19131 and ISO 19115
- UML for data model description
- XML (GML)
- OGC standards for geospatial data (WMS, WFS, WFS-T, CSW)

Partners from countries where some national standards have been established, required the compatibility with these rules; there are extended or slightly modified general standards (as listed above) in most of cases.

Technical possibilities and alternative infrastructures

The most used GIS SW are ESRI products and CAD products are presented mainly by Microstation or Autocad. Although some versions of these products support the basic standards for common interoperability, this functionality is not often used; sometimes because of high price of such extensions, and sometimes because of the necessity of specialized knowledge. For Open Source products, mainly systems based on Minnesota MapServer, Geoserver or Open Layers components are used for the building of spatial data publication systems.

One of the main challenges of the Plan4all project is the possibility for combination of spatial data and services from different sources across the European Community in a consistent way without involving specific efforts of humans or machines. It is expected that users will spend less time and efforts on understanding and integrating data when they build their applications based on data delivered within INSPIRE. The solution should be technologically independent and it should allow implementation of a solution based on either commercial or Open Source platforms.

Used IPRs models

It seems that there are not major differences among countries regarding IPR for spatial planning. General copyright rules of national level are applied also for spatial planning. The restrictions including fees are asserted mainly in the cases of the original data exchange, for example from engineering mains providers to authorities or from authorities to business companies (real estates). On the other hand, data sharing without direct original data exchange (web visualization, WMS) is used without restrictions or only with plain copyright.

A very good proposal for DRM from the local authority point of view is presented in the Olomouc usecase (see chapter 3.4 Ideas regarding DRM)

Conclusion

Currently used methods of spatial planning do not make effective use of shared data and web technologies that ensure the better use of geographic data and support the interoperability of planned solutions together with the active participation of all stakeholders in the planning process. There are big differences among individual European countries in usage of the new technologies for spatial planning data, but also the countries with much experience regarding spatial data can now move forward. Mostly they have a big advantage – a vision of what they need.

On the other hand, less experienced countries or regions can turn profit from the collaboration and skip the problems associated with the development.

Case studies from individual countries and regions highlight differences among countries, but they also point out several ways to improve spatial planning processes. Most of the requirements stress interoperability, harmonisation of data sets from different sources, and the possibility of data sharing. The analysis of how the Plan4all project should cover these requirements and which models will be developed and implemented, is a task for following workpackages.

References

Case Studies:
http://wiki.plan4all.eu/wk/images/4/4e/Plan4all_Study_CZ_Olomouc.pdf
http://wiki.plan4all.eu/wk/images/7/7b/Plan4all_Study_DE_LGV.pdf
http://wiki.plan4all.eu/wk/images/d/d1/Plan4all_Study_LV_ZPR.pdf
http://wiki.plan4all.eu/wk/images/d/df/Plan4all_Study_IT_ProvRoma.pdf
http://wiki.plan4all.eu/wk/images/6/6b/Plan4all_Study_MT_FTZ.pdf
http://wiki.plan4all.eu/wk/images/1/11/Plan4all_Study_GR_Georama.pdf
http://wiki.plan4all.eu/wk/images/0/06/Plan4all_Study_ES_Navarra.pdf
http://wiki.plan4all.eu/wk/images/d/dc/Plan4all_Study_ES_Gijon.pdf
http://wiki.plan4all.eu/wk/images/5/54/Plan4all_Study_IE_MAC.pdf
http://wiki.plan4all.eu/wk/images/2/2b/Plan4all_Study_NO_Avinet.pdf
http://wiki.plan4all.eu/wk/images/4/46/Plan4all_Study_BG_EPF.pdf
http://wiki.plan4all.eu/wk/images/e/ea/Plan4all_Study_RO_NWRDA.pdf
http://wiki.plan4all.eu/wk/images/c/cc/Plan4all_Study_IT_Lazio.pdf
http://wiki.plan4all.eu/wk/images/a/a2/Plan4all_Study_FR_MEEDDM.pdf

ANNEX 1 Spatial planning data

Hamburg data:

1) topographic base maps (up to 1:25.000), aerial image (40cm), protected sites, hydrography, geology, natural risk zones, noise emissions, urban land use plans, land cover, landscape program, wildlife conservation programme, administrative and social governmental services in Hamburg

2) real estate cadastre, topographic base maps, aerial image (up to 10cm), protected sites, hydrography, geology, natural risk zones, noise emissions, urban land use plans, land cover, landscape program, wildlife conservation programme, administrative and social governmental services in Hamburg

3) real estate cadastre, ground value

4) real estate cadastre, ground value

5) partner of the spatial data infrastructure Hamburg Metropolitan Region: "LGV Hamburg" – Agency for Geo-Information and Surveying Hamburg, "LGN Lower Saxony" - Geodetic Survey of Lower Saxony, Interior Ministry of Schleswig Holstein, six counties of Lower Saxony, six counties of Schleswig Holstein bordering the Free and Hanseatic City of Hamburg

6) The project mainly focuses on comprehensive regional planning at federal state and county level, urban land-use planning, protected sites, tourism, education and commercial areas related datasets.

7) searching for and finding industrial and commercial sites

	Non updated records – providers didn't evaluate Case study
	Non updated records – providers evaluated Case study
	Records to erase – providers offer different datasets
	Added records

Quantity and Quality of the Content								
Provider	**Type**	**Quantity & Definition**	**Format & Quality**	**IPR**	**Current Use**	**Existing Metadata**	**Language**	**Additional comments**
Olomouc - ÚPnSÚ	maps	100 km^2 ;66MB – 90 layers;	*.dgn,	Public domain	Olomouc municipal office	NO	Czech	Municipal Plan of the Olomouc Urban Unit (Local plan)
Olomouc - ÚPnSÚ	text	Cca 300 pages of text	*.doc	Public domain	Olomouc municipal office	NO	Czech	Municipal Plan of the Olomouc Urban Unit (Local plan)
Olomouc – RP MPR	maps	0.8 km^2; 30MB	*.dgn	Public domain	Olomouc municipal office	NO	Czech	Regulatory plan of Urban Conservation Area
Olomouc – RP MPR	text	100 pages	*.doc	Public domain	Olomouc municipal office	NO	Czech	Regulatory plan of Urban Conservation Area
Olomouc - ÚAP	maps ÚAP-	450 km^2	*.shp; *.dgn	Public domain	Olomouc municipal office	ISO 19115	Czech	planning analytical materials
Olomouc - ÚAP	graphics ÚAP- adjusted data from different	450 km^2	*.shp	corporate/restricted	Olomouc municipal office	ISO 19115	Czech	planning analytical materials

	providers							
Olomouc - ÚP	maps	100 km^2	*.dgn	Public domain	-	ISO 19115	Czech	Concept of new Local plan To come in 05/2010
Olomouc – Cenová mapa	map	1 layer; 100 km^2	*.dgn	Public domain	Olomouc municipal office	NO	Czech	Price mp of building plots
Government of Navarre- POT	Text, image	10.421km^2	PDF	Public domain	Government of Navarre- Navarre Region	NO	Spanish	Regional Spatial planning Programme
Government of Navarre- PEDP	Text, image	1.894 km^2, 291 pages	PDF	Public domain	Government of Navarre- Pyrenees	NO	Spanish	Pyrenees Development Plan
Government of Navarre- Grisi4soho	Text, image, cartography	1.894 km^2, 21 scanned maps, 91 pages	PDF	Public domain	Government of Navarre- Pyrenees	NO	Spanish	Interreg IIIC Subproject
Government of Navarre- SIUN	Text, image, cartography	10.421km^2, 272 scanned maps and 272 texts	PDF	Public domain	Government of Navarre- Navarre	NO	Spanish	Urban Information System of Navarre
Government of Navarre- ETN	Text, image, cartography	10.421 km2, 191 pages	PDF	Public domain	Government of Navarre- Navarre	NO	Spanish	Territorial Strategy of Navarre
Government of Navarre- SITNA	Text, image, cartography	10.421 km^2, 191 layers		Public/corporate/ restricted	Government of Navarre- Navarre	ISO 19115	Spanish, English	Land Information System of Navarre
Government of Navarre- IEN	Data, graphs	10.421 km2, several data		Public domain	Government of Navarre- Navarre	ISO 19115	Spanish	Statistical Institute Of Navarre
Government of Navarre. Geographical grid systems	Maps	10.421km^2	JPG	Public domain	Government of Navarre- Navarre	ISO 19115	Spanish	

(harmonised multi-resolution grid)								
Government of Navarre. Geographical names	Maps	10.421km^2	JPG	Public/restricted	Government of Navarre- Navarre	ISO 19115	Spanish	
Government of Navarre. Administrative units (local, regional and national boundaries)	Maps	10.421km^2	JPG	Public domain	Government of Navarre- Navarre	ISO 19115	Spanish	
Government of Navarre. Addresses	Maps	10.421km^2	JPG	Public domain	Government of Navarre- Navarre	ISO 19115	Spanish	
Government of Navarre. Cadastral parcels	Maps	10.421km^2	JPG	Public/corporate/ restricted	Government of Navarre- Navarre	ISO 19115	Spanish	
Government of Navarre. Transport networks (road, rail, air, water and links between networks)	Maps	10.421km^2	JPG	Public/corporate/ restricted	Government of Navarre- Navarre	ISO 19115	Spanish	
Government of Navarre. Hydrography (including marine areas, all water bodies, river basins, etc.)	Maps	10.421km^2	JPG	Public domain	Government of Navarre- Navarre	ISO 19115	Spanish	
Government of Navarre. Protected sites	Maps	10.421km^2	JPG	Public domain	Government of Navarre- Navarre	ISO 19115	Spanish	

(designated by national, EU or international legislation)								
Government of Navarre. Elevation (land, ice and ocean surfaces; terrestrial elevation, bathymetry, shoreline)	Maps	10.421km^2	JPG	Public domain	Government of Navarre- Navarre	ISO 19115	Spanish	
Government of Navarre. Land cover (physical and biological)	Maps	10.421km^2	JPG	Public/corporate	Government of Navarre- Navarre	ISO 19115	Spanish	
Government of Navarre. Orthoimagery (geo-referenced image data)	Maps	10.421km^2	JPG	Public domain	Government of Navarre- Navarre	ISO 19115	Spanish	
Government of Navarre. Geology (including bedrock, aquifers and geomorphology)	Maps	10.421km^2	JPG	Public domain	Government of Navarre- Navarre	NO	Spanish	
Government of Navarre. Statistical units (for dissemination or use of statistical data)	Maps	10.421km^2,	JPG	Public domain	Government of Navarre- Navarre	ISO 19115	Spanish	
Government of	Maps	10.421km^2	JPG	Public domain	Government of	ISO 19115	Spanish	

Navarre. Buildings (geographical location of buildings)					Navarre- Navarre			
Government of Navarre. Soil (and sub-soil characteristics)	Maps	10.421km^2	JPG	Public/corporate	Government of Navarre- Navarre	ISO 19115	Spanish	
Government of Navarre. Land use (e.g. residential, industrial, commercial, etc.)	Maps	10.421km^2	JPG	Public/restricted	Government of Navarre- Navarre	ISO 19115	Spanish	
Government of Navarre. Human health and safety	Maps	10.421km^2	JPG	Public domain	Government of Navarre- Navarre	ISO 19115	Spanish	
Government of Navarre. Utility and governmental services (sewage, waste management, energy, etc.)	Maps	10.421km^2	JPG	Public/restricted	Government of Navarre- Navarre	ISO 19115	Spanish	
Government of Navarre. Environmental monitoring facilities (emissions, ecosystem parameters)	Maps	10.421km^2	JPG	Public domain	Government of Navarre- Navarre	ISO 19115	Spanish	
Government of Navarre. Production and industrial	Maps	10.421km^2	JPG	Public/restricted	Government of Navarre- Navarre	ISO 19115	Spanish	

facilities (water abstraction, mining, storage sites)								
Government of Navarre. Agricultural and aquacultural facilities	Maps	10.421km^2	JPG	Restricted	Government of Navarre- Navarre	ISO 19115	Spanish	
Government of Navarre. Area management / restrictions / regulation zones / reporting units	Maps	10.421km^2	JPG	Public/restricted	Government of Navarre- Navarre	ISO 19115	Spanish	
Government of Navarre. Natural risk zones (e.g. atmospheric, hydrologic, seismic, volcanic, wildfire)	Maps	10.421km^2	JPG	Public/restricted	Government of Navarre- Navarre	ISO 19115	Spanish	
Government of Navarre. Meteorological geographical features (weather conditions, measurements)	Maps	10.421km^2	JPG	Public domain	Government of Navarre- Navarre	ISO 19115	Spanish	
Government of Navarre. Bio-geographical regions (areas with homogeneous ecological conditions)	Maps	10.421km^2	JPG	Public domain	Government of Navarre- Navarre	ISO 19115	Spanish	

Government of Navarre. Habitats and biotopes (geographical areas for specific ecological conditions)	Maps	10.421km^2	JPG	Public domain	Government of Navarre- Navarre	ISO 19115	Spanish	
Government of Navarre. Species distribution (geographical boundaries for animal and plant species)	Maps	10.421km^2	JPG	Public domain	Government of Navarre- Navarre	NO	Spanish	
Province of Rome	Raster Data	5 Bases topographical 4 Mosaics orthophotos	geoTIFF, ECW 300<r<400 dpi	public domain while respecting the constraints of copyright	Private, Public Administrations and all registered users to the website	Maximum of 28 fields subset of ISO 19115	Italian	
Province of Rome	Raster Data	17 satellite imagery	1<r<30 meters Raw,ECW, geoTIFF	public domain while respecting the constraints of copyright	Private, Public Administrations and all registered users to the website	Maximum of 28 fields subset of ISO 19115	Italian	
Province of Rome	Vector Data	About 350 Layers *(1)	ORACLE DBMS Scale: 1:10.000	public domain while respecting the constraints of copyright	Private, Public Administrations and all registered users to the website	Maximum of 28 fields subset of ISO 19115	Italian	
Province of Rome	Vector Data	About 30 Layers *(1)	ORACLE DBMS Scale: 1:25.000	public domain while respecting the constraints of copyright	Private, Public Administrations and all registered users to the website	Maximum of 28 fields subset of ISO 19115	Italian	
Province of Rome	Vector Data	About 20 Layers *(1)	ORACLE DBMS Scale:	public domain while respecting the constraints of copyright	Private, Public Administrations and all registered users to the	Maximum of 28 fields subset of ISO 19115	Italian	

			1:100.000		website			
Province of Rome	Vector Data	About 300 Layers *(1)	ORACLE DBMS Scale: N.A.	public domain while respecting the constraints of copyright	Private, Public Administrations and all registered users to the website	Maximum of 28 fields subset of ISO 19115	Italian	Data come from different sources . The data quality is being checked.
GEORAMA	Text	Emergency Plans (3) Municipal Management Plan (1)	Doc, paper	Public domain	Deciders and technical personnel	Under preparation	Greek	
Zemgale Planning region	Text, image, cartography (Maps Image / vector data)	Zemgale Region territory 10739,096 km2	*.dgn *.doc *.shp *.jpg *.pdf	No	Zemgale Planning Region	ISO 19115	Latvian	● Zemgale Planning Spatial Plan ● Industrial territories ● Local authorities spatial plans ● Detailed plans of local authorities
Gijón City Council	Maps	181 Km2	*.dgn	corporate/restricted	Gijón municipal office	No	Spanish	Municipal Plan of Gijón
Gijón City Council	Text	424 Mb	*.doc	Public domain	WebSite & municipal offices	No	Spanish	Municipal Plan of Gijón
Gijón City Council	Maps	9 files 29,9 Mb	*.pdf	Public domain	WebSite	No	Spanish	Maps of districts
Gijón City Council	Maps	27 files 23,7 Mb	*.pdf	Public domain	WebSite	No	Spanish	Industrial Areas
Gijón City Council	Maps	835 Mb	*.pdf 1/4000 1/2000 and 1/1000	Public domain	WebSite & municipal offices	No	Spanish	Municipal Plan of Gijón
Gijón City Council	Maps	15 MB	*.jpg	Public domain	WebSite & municipal offices	No	Spanish	Topographic, Hydrographic, 3D
Gijón City Council	Maps	4,52 Gb	*.jpg	Public domain	WebSite & municipal offices	No	Spanish	Orthophoto 2006,

								Orthophoto 2002
Gijón City Council	Vector Data	575 Mb	Shapefile	corporate/restricted	Gijón municipal office	No	Spanish	Used with iPlan and other planning applications.
Gijón City Council	Vector Data	1.81 Gb	MDT	corporate/restricted	Gijón municipal office	No	Spanish	Digital Terrain Model
Gijón City Council	Vector Data	122 Mb	Shapefile	corporate/restricted	Gijón municipal traffic office	No	Spanish	Used with traffic applications
Free and Hanseatic City of Hamburg, Ministry of Urban Development and Environment	Image / vector data	OGC Web Map Services / Web Feature Services / Web Feature Gazetteer Service (eg. Address Register) [1)]	Format: GIF, PNG, JPG, TIFF, BMP, SVG, GML & Quality: colored images	Public access to websites	users of the websites	yes; based on the software 'Environmental Data Catalogue'	German	
Free and Hanseatic City of Hamburg, Ministry of Urban Development and Environment	Image / vector data	ArcIMS / Autodesk MapGuide and OGC Web Map Services / Web Feature Services / Web Feature Gazetteer Service (eg. Address Register) [2)]	Format: Oracle Spatial , ArcSDE, PostgreSQL / PostGIS, DWG, SHP, GIF, PNG, JPG, TIFF, BMP, SVG, GML	Intranet	users of the intranet	yes; based on the software 'Environmental Data Catalogue'	German	
Free and Hanseatic City of Hamburg, Ministry of Urban Development and Environment	Image / vector data	Autodesk MapGuide [3)]	PNG, JPG, TIFF + MapGuide Plugin	limited access to data (for registered users, on the bases of agreement, for payment)	Registered uses of the website	yes; based on the software 'Environmental Data Catalogue'	German	
Free and	Image data	ArcIMS [4)]	PNG, JPG,	limited access to	users of the	yes; based on the	German	

Hanseatic City of Hamburg, Ministry of Urban Development and Environment				data (on the bases of agreement for payment)	websites	software 'Environmental Data Catalogue'		
spatial data infrastructure Hamburg Metropolitan Region [5)]	Image / vector data	OGC Web Map Services / Web Feature Services / Web Feature Gazetteer Service (eg. Address Register) [6)]	GIF, PNG, JPG, TIFF, BMP, SVG, GML & Quality: colored images	Public access to websites	public authorities and residents of the federal states of Hamburg, Schleswig-Holstein and Lower Saxony	partly	German	
Hamburg Metropolitan Region	Image data	OGC Web Map Services [7)]	GIF, PNG, JPG, TIFF	Public access to websites	users of the websites	partly	German / English	
Open Street Map	WMS,WFS	All Latvia	PostGIS	Public	Public	Yes	LV, EN	No
Service provider – GisNet.lv	Soviet topographic maps from 1:3M to 1:10 000 as WMS service	All Latvia	TIFF (Different quality for different scale maps)	Service is free for non commercial purpouses	Public	No	LV	No
Data provider - Latvia Geoinformation Agency; Service provider – Zemgale Planning Region	Ortophoto WMS	Zemgale planning region	TIFF (0,5m/px) Stored in ArcSDE database	-	For planning region purpouses only	Partialy	Latvian	No
Data provider - Latvia Geoinformation Agency; Service provider – Zemgale Planning Region	Topographic map 1:10 000, WMS	Zemgale planning region	ArcSDE (originaly MicroStation DGN)		For planning region purpouses only	Yes	LV	No
Grisi plus project	WMS, WFS	Bauska. Jelgava	ArcSDE			Yes	LV	No

data for Latvia		region		Public	Public			
FTZ-Malta	Text	10,000 pages	PDF	License	None	None available	English	
FTZ	Image	15,000 pictures and maps	JPEG, 300 dpi	License	None	None available	English	
FTZ	Video	500 clips	Qicktime	License	None	None available	English	
Limerick County Council, Ireland, working with MAC	Maps	Thousands, various definitions from county-wide to specific building planning map.	MapGuide (.mwf) with some GeoMedia (.pmf)	Public/Corporate Restricted	Web-based public planning applications.	No	English	Used with iPlan and other planning web applications.
Cork County Council, Ireland, working with MAC	Maps	Thousands, various definitions from county-wide to specific building planning map.	MapGuide (.mwf) with some GeoMedia (.pmf)	Public/Corporate Restricted	Web-based public planning applications.	No	English	Used with iPlan and other planning web applications.
Donegal County Council, Ireland, working with MAC	Maps	Hundreds, various definitions from county-wide to specific building planning map.	MapGuide (.mwf) with some GeoMedia (.pmf)	Public/Corporate Restricted	Web-based public planning applications.	No	English	Used with iPlan and other planning web applications.
Galway County Council, Ireland, working with MAC	Maps	Hundreds, various definitions from county-wide to specific building planning map.	MapGuide (.mwf) with some GeoMedia (.pmf)	Public/Corporate Restricted	Web-based public planning applications.	No	English	Used with iPlan and other planning web applications.
DipSU	Vector Data	About 50 layers	*.shp	public domain while respecting the constraints of copyright	Municipality of Anguillara (Rome)	NO	Italian	Geographic information system for the local plan
DipSU	Vector Data	About 70 layers	*.shp	public domain while respecting the constraints of copyright	Municipality of Guidonia (Rome)	NO	Italian	Geografical information system for the

								local plan
DipSU	Vector Data	About 20 layers	*.shp	public domain while respecting the constraints of copyright	Province of Rieti (Lazio Region)	NO	Italian	Geographic information system for the development plan of the tiber valley
DipSU	Vector data	About 15 layers	*.shp	public domain while respecting the constraints of copyright	Lazio Region	YES	Italian	Geographic information system ofor the landscape territorial plan
DipSU	Vector data	About 20000 cadastral parcels	Geodatabase Postgis	public domain while respecting the constraints of copyright	All users - Webgis	YES	Italian	Gregorian cadastral geodatabase of Rome
SFCM	GIS-data, planning	County wide, 10 themes x 26 municipalities	Shapefiles, < > 1:5 000	SFCM + National mapping authorities	Offline, web atlas	ISO 19115	Norwegian	
SFCG	GIS-data, environment	County wide, 8 themes x 26 municipalities	Shapefiles < > 1: 5000	SFCG + Directorate of Nature Preservation + National mapping authorities	Offline, web atlas	ISO 19115	Norwegian	
Lazio Region	image	Technical cartography, entire Region	TIFF, 1:10.000, grayscale	public domain	public and private	yes	Italian	
Lazio Region	image	Technical cartography, provinces of Rome, Latina, Viterbo	TIFF, 1:5000, colour	Public domain	public and private	yes	Italian	cartographies for remaining Provinces are ongoing

Lazio Region	vector	Technical cartography, provinces of Rome, Latina, Viterbo	shape, 1:5000	licensed	public	yes	Italian	numerical data or remaining Provinces are ongoing
Lazio Region	vector	administrative boundaries, entire Region	shape, 1:10000	Public domain	public and private	yes	Italian	
ISTAT	vector	statistical and administrative boundaries, entire Region	shape, 1:10000	Public domain	public and private	yes	Italian	
Lazio Region	vector	DBPrior, entire Region	shape, 1:10.000	Public domain	public and private	yes	Italian	
Lazio Region	vector	Corine Land Cover, entire Region	shape, 1:25000	Public domain	public and private	yes	Italian	
Lazio Region	vector	Regional Land Use, entire Region	shape, 1:10000	Public domain	public and private	yes	Italian	
Lazio Region	vector	Environmental plan, entire Region	shape, 1:10000	public domain	public and private	yes	Italian	
Tevere's Basin Authority	vector	Hydro-geological safety plan	shape, 1:10000	public domain	public and private	yes	Italian	
Lazio Region	vector	Geological maps, entire Region	shape, 1:25000	public domain	public and private	yes	Italian	
Lazio Region	vector	Burned areas, entire region	shape, 1:10000	public domain	public and private	yes	Italian	
TIME	Text, Images	Municipal plan for regional development(1) Municipal Master plan (2)	Doc, paper (1&2) TIFF(2)	Public domain	Accessible for the public (including online), Deciders and technical personnel	Yes	Bulgarian	
TIME	Basic geographical data (digital)	Municipality - 1/10000, aerial photographs, Quick bird Satellite Images	Geodatabase, raster	Public domain	Deciders and technical personnel	Under preparation	Bulgarian	

TIME	Planning data (digital)	Land cover and Landuse, special zones, infrastructure	Geodatabase	Public domain	Deciders and technical personnel	Under preparation	Bulgarian	
Varna municipality, working with EPF	Maps	Municipal plan for regional development(1) Municipal Master plan (2)	**Doc, paper (1&2) TIFF(2)**	Public	Accessible for the public (including online), Deciders and technical personnel.	No	Bulgarian	Varna municipality, working with EPF
	Basic geographical data (digital)	Municipality - 1/10000, aerial photographs, Quick bird Satellite Images	Geodatabase, raster	Public domain	Deciders and technical personnel	No	Bulgarian	
	Planning data (digital)	Land cover and Landuse, special zones, infrastructure	Geodatabase	Public domain	Deciders and technical personnel	No	Bulgarian	
AMFM	Vector maps, ortophotos, alphanumeric data, images, text	Regional plans Maps, Regional plans rules, statistical associated data, obtainable from AMFM members	DWG, SHP, DBF, MDB, ORACLE DBMS, JPEG, WMS, WFS	public domain while respecting the constraints of copyright of the specific provider	Public Administrations, professionals, interested citizens	Subset of ISO 19115	Italian	AMFM members will be called to contribute with data to PLAN4ALL project
HSRS	Vector maps, WMS	CLC2000, CLC2006	Postgress	Licence for research purposes	Public administration	ISO19115/ISO19119	English	Land cover
HSRS	Raster data	IMAGE2000 IMAGE2006	Postgress	Licence for research purposes	Public administration	ISO19115/ISO19119	English	Ortophoto
HSRS	Vector maps, WMS	Murbandy	Postgress	Licence for research purposes	Public administration	ISO19115/ISO19119	English	Land cover
HSRS	Vector maps, WMS	Complex Land use for 20 municipalities	Postgress	Public domain	Public administration, investors	ISO19115/ISO19119	Czech	Land use, utilities, protected areas
MEEDDM GeoADS	Maps and digital text	On going a survey is being	Web map server	Public domain	Intranet website	Will be documented	French	As the GeoADS project is starting

GeoSUP Digital PLU-CC		Finalised to identify the Number of PLU and SUP that will be made available	PDF			using ISO 19115		technical details will be available begining of 2010
Help Forest	Vector maps, WMS	Complex Land use for 2 municipalities	Postgress	Public domain	Public administration, investors	ISO19115/ISO19119	Czech	Land use, utilities, protected areas

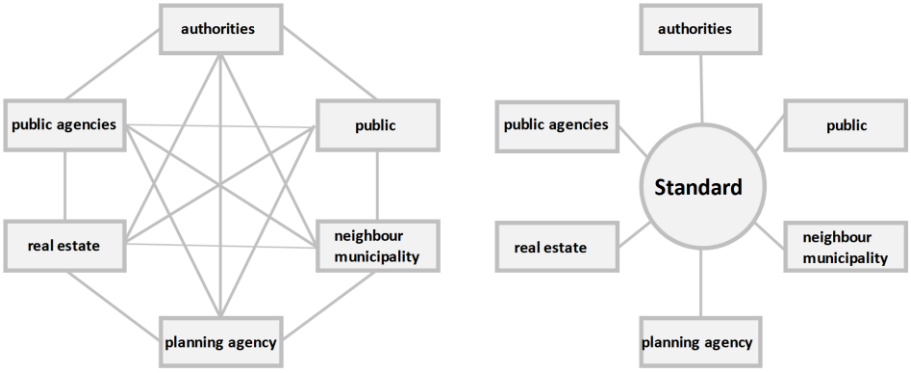
ANNEX 2 Survey of requirements regarding user groups

Requirements according user groups	
Institution	*Olomouc, Czech republic*
Collected by	*Lea Manakova, Miloslav Dvorak*
User Groups	*Requirements*
Spatial planning authorities	• *Data preview within their administrative territory and "border zone" at local and regional level (as for the plan, the data preview means also the interconnection of attributes of individual elements with the text part of the plan – regulations related to individual areas with different way of usage)* • *Data management (at our level it is the management of our own data) in form of geospatial database* • *Data editing (this concerns our level and PAM)* • *Data browsing via WMS service with the option of attribute and spatial questioning about geospatial data.* • *Publishing of restricted volume of geospatial data to the compilers (mainly municipal area and buffer approximately 500m from PAM)* • *Import of changes made by compilers into the unified data warehouse (revision control and comparison of contents of the data sets and their synchronizing)*
Other Civil Service authorities	• *Preview of the planning documentation in case of publishing opinions on the negotiated planning documentation;* • *Nature conservation authorities that need delimitation of TSES from the plans (where it is mandatory) for publishing opinions within the common work agenda (for modification of TSES)- are a special case*
Owners of transport and technical infrastructure	• *Easy import of geospatial data into the database of Spatial planning Authority* • *Possibility of dynamic conversion of the data models (import) of geospatial data of the technical infrastructure providers into the Olomouc City Council model. The goal is to implement the technological processes for the most automatic processing of the entry data from various, but known sources. Still, there is a risk of DM instability for data output on the part of providers.*
Planning engineers, city planners	• *documentation preview* • *map export for using as a material* • *metadata catalogue preview* *Commentary:* *Retrieval of civil engineering main data provided by their administrator is very limited. Their mass distribution to the users of this group cannot be expected. Appropriately designed business model (future question) could solve this problem to satisfaction of all interested parties.* • *Planning engineers of the plans and planning studies are a special case – if they project the planning documentation or the planning studies, they can get the data that we get for PAM, and they should have chance to download the data directly* • *For spatial planning data preview we prefer to use the WMS server or the web-based thin client that enables printing of a map part or the whole plan*

	• *Considering the fact that the creation of the plan is a longtime process and the data in PAM can be updated in the course of processing, it would certainly be interesting, if they could download the data of the currently projected area and the mentioned buffer (via WFS) while working to order*
Firms	• *documentation preview* • *metadata catalogue preview*
NGO	• *documentation preview* • *metadata catalogue preview*
Investors, real estate owners	• *documentation preview* • *metadata catalogue preview* • *commercial distribution of the "value" map* • *a map application (e-shop) would be prepared for this user group; it would be possible to buy a map made up of layer combination of the Price map, Plan, Regulation plan etc.there*
Real estate agents	• *documentation preview* • *metadata catalogue preview* • *commercial distribution of the "value" map* • *a map application (e-shop) would be prepared for this user group; it would be possible to buy a map made up of layer combination of the Price map, Plan, Regulation plan etc.there*
Public	• *documentation preview (documentation preview for general public should be enabled via web-based thin client that would be available at the City Council server)* • *metadata catalogue preview* • *It would be also good to have the analytical functions option over the data within the portal – e.g. finding the projected areas for living, up to the distance of 5 km from the Olomouc city centre as a part of documentation preview* • *Adding the comments into the map (user's graphics) at the time when the planning documentation is discussed* • *Users (citizens, public representative, owners) could be able to delimitate the area that the comment to the plan refers to; the comment is handed in writing*
Students	• *documentation preview (documentation preview for general public should be enable via web-based thin client that would be available at the City Council server)* • *metadata catalogue preview* • *sending an electronic request for the geospatial data in the required extent*
Other group xxx	
Other group xxx	
Other group xxx	
Common requirements	• *the basic functions of geographic information systems* • *common requirements on data combination* • *and their disclosure in the form of map projects (thin client, WMS or WFS), rastr outputs or database descriptive data*
Spatial requirements	
Additional remarks	

Requirements according user groups	
Institution	*North-West RDA, Romania*
Collected by	*Gergely Torok*
User Groups	*Requirements*
Spatial planning authorities	• *Access to data preview also at local and regional level* • *Free access to spatial planning data* • *Data management in form of a geospatial database* • *Possibility for data editing* • *Data browsing via WMS service with the option of attribute and spatial questioning about geospatial data (analyses)* • *Possibility to import changes to datasets made by others* • *The implementation at national level of standards regarding data collection (also applying to metadata)* • *Interoperability of all spatial data collected, standardization of software that could be used (standardization of features, functions and data that can be processed)*
Other Civil Service authorities	
Owners of transport and technical infrastructure	
Planning engineers, city planners	• *documentation preview* • *possibility to export maps* • *possibility to preview metadata catalogue* • *access to WMS with the possibility to download and analyze, make different measurements*
Firms	• *documentation preview* • *metadata catalogue preview*
NGO	• *documentation preview* • *metadata catalogue preview* • *possibility to export maps* • *access to WMS with the possibility to download and analyze, make different measurements*
Investors, real estate owners	• *documentation preview* • *metadata catalogue preview* • *a very good idea by Olomouc, to have a web application (e-shop) for this user group where it would be possible to buy a map made up of layer combination*
Real estate agents	
Public	• *documentation preview* • *metadata catalogue preview* • *points of interest on the requested maps by category* • *possibility to add comments, new information*
Students	• *documentation preview*

	• *metadata catalogue preview* • *possibility for sending electronic requests for geospatial data not available via the WMS services*
Other group xxx	
Other group xxx	
Other group xxx	
Common requirements	
Spatial requirements	
Additional remarks	

Requirements according user groups	
Institution	*LGV, Germany*
Collected by	*Kai-Uwe Krause*
User Groups	***Requirements***
Spatial planning authorities	• *Lossless data exchange between the actors involved in planning processes*  • *Standardised data exchange format for horizontal (intermunicipal) and vertical (planner – municipality – county – federal state) process of coordination of planning* • *Support electronically assisted proceeding on the granding of planning permission* • *Standardised data format for e-participation platforms* • *Semantic description of planning data as a basis for the establishment of services (query, monitoring, reporting) and visualisation in different software applications* • *Central storage of urban land-use plans / other plans of special urban planning legislation (e.g. formally designated redevelopment area) in a uniform semantic structure as a data base for different software applications and information systems* • *Visualisation original legal plans by Web Map Service (bit mapped raster*

	graphic + overlaying vector data to no visualization style is assigned, which carries however feature data for WMS get feature info queries) for a municipality and their surroundings
	
	• *Visualization the scope designated by a binding land use plan by Web Map Service + Visualization of the original legal plan as PDF file for a municipality and their surroundings*
	
	• *Visualisation INSPIRE annex III compliant land use data sets as a SLD/SE Web Map Service*
	
	• *Meta data search for:*
	
	  • *Name and number of urban land use plans*
	  • *Information to the date of establishment, public display period, notification of permission of urban land use plans*
	  • *Legal foundation of urban land use plans*
	  • *Main designation of land use purpose*

Other civil service authorities / public agencies / owners of transport and technical infrastructure	• *Visualization of the original legal plan by Web Map Service (bit mapped raster graphic + overlaying vector data to no visualization style is assigned, which carries however feature data for WMS get feature info queries)*
	
	• *Visualization of the scope designated by a binding land use plan by Web Map Service + Visualization of the original legal plan as PDF file*
	
	• *Providing the scope designated by binding land use plans and the vector data of urban land use plans by Web Feature Services*
	
	• *Supply of an electronic participation platform*
	
	• *Meta data search for:*
	
	  • *Name and number of urban land use plans*
	  • *Information to the date of establishment, public display period, notification of permission of urban land use plans*
	  • *Legal foundation of urban land use plans*
	  • *Main designation of land use purpose*

Planning engineers, city planners	• *Visualisation original legal plans by Web Map Service (bit mapped raster graphic + overlaying vector data to no visualization style is assigned, which carries however feature data for WMS get feature info queries) for a municipality and their surroundings*
	
	• *Visualization the scope designated by a binding land use plan by Web Map Service + Visualization of the original legal plan as PDF file for a municipality and their surroundings*
	
	• *Urban land use plan has to be allocated in a standardised data exchange format to the municipality*
	
	• *Meta data search for:*
	
	  • *Name and number of urban land use plans*
	  • *Information to the date of establishment, public display period, notification of permission of urban land use plans*

	• *Legal foundation of urban land use plans* • *Main designation of land use purpose*

Firms	• *Visualization of the original legal plan by Web Map Service (bit mapped raster graphic + overlaying vector data to no visualization style is assigned, which carries however feature data for WMS get feature info queries)*
	• *Visualization of the scope designated by a binding land use plan by Web Map Service + Visualization of the original legal plan as PDF file*
	• *Visualization of INSPIRE Annex III Themes: protected sites, Area management/restriction/regulation zones and reporting units, Natural risk zones, Bio-geographical regions, Habitats and biotopes, Species distribution, Energy resources, Mineral resources*
	• *Access to ground value information*
	• *Meta data search for:*
	  • *Name and number of urban land use plans*
	  • *Information to the date of establishment, public display period, notification of permission of urban land use plans*
	  • *Legal foundation of urban land use plans*
	  • *Main designation of land use purpose (e.g. industrial area, commercial area, centre zone*

Public / NGO	• *Visualization of the original legal plan by Web Map Service (bit mapped raster graphic + overlaying vector data to no visualization style is assigned, which carries however feature data for WMS get feature info queries)*
	• *Visualization of the scope designated by a binding land use plan by Web Map Service + Visualization of the original legal plan as PDF file*
	• *Supply of an electronic participation platform*
	• *Meta data search for:*
	  • *Name and number of urban land use plans*
	  • *Information to the date of establishment, public display period, notification of permission of urban land use plans*
	  • *Legal foundation of urban land use plans*
	  • *Main designation of land use purpose*

Investors, real estate owners / Real estate agents	• *Visualization of the original legal plan by Web Map Service (bit mapped raster graphic + overlaying vector data to no visualization style is assigned, which carries however feature data for WMS get feature info queries)*
	• *Visualization of the scope designated by a binding land use plan by Web Map Service + Visualization of the original legal plan as PDF file*
	• *Access to ground value information*
	• *Meta data search for:*
	  • *Name and number of urban land use plans*
	  • *Information to the date of establishment, public display period,*

	notification of permission of urban land use plans • *Legal foundation of urban land use plans* • *Main designation of land use purpose (e.g. industrial area, commercial area, centre zone*

Students	• *Visualization of the original legal plan by Web Map Service (bit mapped raster graphic + overlaying vector data to no visualization style is assigned, which carries however feature data for WMS get feature info queries)*
	• *Visualization of the scope designated by a binding land use plan by Web Map Service + Visualization of the original legal plan as PDF file*
	• *Providing the scope designated by binding land use plans and the vector data of urban land use plans by Web Feature Services*
	• *Meta data search for:*
	  • *Name and number of urban land use plans*
	  • *Information to the date of establishment, public display period, notification of permission of urban land use plans*
	  • *Legal foundation of urban land use plans*
	  • *Main designation of land use purpose*

Common requirements	*List of common requirements from your point of view*
Spatial requirements	• *development and supply of "plan4all" database schemata (e.g. land-use for Oracle or PostgreSQL/PostGIS)* • *Definition of SLD / SE portrayal stiles for "plan4all" themes*

Requirements according user groups	
Institution	*Nasursa, Spain*
Collected by	*Aldert de Vries and Marian García*
User Groups	***Requirements***
Spatial planning authorities	*For the **elaboration of spatial plans** which are within the competence of the department (ETN, POT, PSIS, PDAT) it is extremely important to avail of the right input of other departments regarding sectoral plans and proposals. In practice, this varies a lot according to every department. Environmental data are very well documented, whereas for example data on economic activities are poor. Data exchange mostly takes place in paper format. A remarkable experience has been the inclusion of logistic areas in the regional spatial plans (POT). This was merely a coincidence of agendas, since other departments were designing a new plan for logistic areas in Navarra at the moment the POTs were in the making.* *Another important issue when elaborating a new plan is the public exposure of intermediate results. At the moment of writing, the regional spatial plans of Navarra are in a phase of public information. The dissemination of the plans has taken place by distributing paper documents and maps, and publishing all documents on internet in PDF format. However, for a citizen, it is still extremely difficult to understand the complexity of all documents, since there is no tool which simplifies the messages (in wording and mapping) or enables interactive access, for example a map application which*

	enables the selection of particular issues of interest. *The **approval of municipal plans** by the department is very much done in a rudimentary way, depending much on the knowledge of the officer in charge. Most relevant documentation, such as the different spatial plans at supramunicipal level (ETN, POT, PSIS), sectoral regulations (environmental conditions) or national and European regulations, is only available on paper format. All this information is being consulted by the officer in charge. However, the completeness of the information, and the interpretation of many regulations is very much based on his or her experience, and not on some working standards.* *In many cases, **consultations of external agents** are made to the department in order to know the different regulations which apply for a certain piece of land. This consultation is still quite rudimentary, based on the name of the municipality, and the knowledge of the officer who is attending.* *Officers within the department do not use **planning data at higher levels or of bordering regions**. This seems to reflect the focus of the department on internal planning processes. However, there are two reasons to invest in this kind of data in future. First, European directives increasingly affect territorial development, and second, Navarra is currently promoting several coordination areas with neighbouring regions (Ebro axis, Pyrenees, Eurocity Bayone-San Sebastian).*
Other Civil Service authorities	*Other departments certainly use planning data, although less intensively than in the department of spatial planning. In many cases, sectoral policies involve territorial criteria or delimitations, which obligatory implies the elaboration of a sectoral plan (PSIS), which in turn has to be coordinated with the department of spatial planning. In most cases, a sectoral department takes the initiative to make a PSIS, and calls for the cooperation of the spatial planning department. Many PSIS have been approved or are being elaborated right now on issues like commercial centers, industrial development, golf courts, camping sites, tourism, wind mills and solar energy installations.* *The degree of involvement of spatial planning data varies largely. A remarkable experience has been the rural development policy, which in turn made use of the planning units at intermediate level established in the Territorial Strategy of Navarra. Although it is hoped that these units are more widely applied across different policies and agencies, until today, most departments still use their own management areas. Regarding the analysis for particular sector policies, the degree of analysis depends on the interest of the department in charge. An example of extensive use of planning data is the making of a new policy for the distribution of commercial centres. The department in charge is making extensive analysis of supply and demand.* *The department of Environment has a special position, since they are in charge of the approval of the environmental impact studies of all regional and municipal plans. They try to get to now the planning proposals in an early stage, in order to propose modifications, but in practice, information is only available in the formal stage of approval. On the other hand, the lack of available planning data impedes the department to actively present proposals to improve environmental conditions, such as decreasing habitat fragmentation or the creation of ecologic corridors.*
Owners of transport and technical	*A first type of data requirements is the need to know where new urban expansion will take place in order to plan for the construction of new*

infrastructure	*infrastructure. According to the MCP, knowing these areas in the proposal stage is very helpful, since they can plan their investments with a larger time span, and in a more integrated way than if they are informed when plans are approved and construction is already starting. Lacking of the right information, personnel of the MCP has even made its own sketch map of possible expansion areas, based on interviews with planners of the Spatial Planning Department.* *A second type of data use is focused on the reservation of space for future infrastructure. An example was mentioned of a main water tube, along which a strip of 10 meters wide has been claimed by the MCP in order to be able to build a wider tube when new urbanisation will take place in the next 50 to 100 years.* *The last type of data use is most common practice: the consultation of detailed urban plans in order to construct a new water tube. For this purpose, they need to know in high detail the delineations of different land uses, including environmental criteria such as tree protection. They claim that there still is a lack of completeness in the available data: there is no way to know which regulations apply to a certain point in the city. Moreover, detail is not always sufficient. Both factors conduct regularly to legal conflicts on particular pieces of land which often are unconditionally needed for utility infrastructures.*
Planning engineers, city planners	*They all work for spatial planning authorities and municipalities, see their respective boxes.*
Firms	
NGO	*Interest groups are an important group. They collect their data on a very ad hoc basis, however, they manage to influence decisions based on those data. There are several cases on local scale, such as the Grupo de Defensa del Río Arga. Maps form an important analytical tool, mostly to see where a certain plan or proposal affects local interest. However, much could be improved offering more interactive and communicative information tools*
Investors, real estate owners	*A group regularly referred to by Plan4all are potential investors, who might be interested in planning data in order to know where to invest. In Navarra, no one could think of an example in which this has been the case. Usually, if an investor has interest in starting a particular development project, it lays down its conditions at the department which is most closely to their scope of activities. Subsequently, there is a lot of pressure to collaborate with the investor in order not to miss the investment opportunity.*
Real estate agents	
Public	
Students	
Municipalities	*Most municipalities dispose of little technical capacity, because of there limited size. In practice, new municipal plans are made by consultants, who organize the gathering, analysis, proposals and presentation of planning data. In practice, information within the municipality is handled on paper, including the phase of public consultation. Section 2.2.1. has already dealt with the type of data included in the elaboration of municipal plans. As far as we have been able to observe, no extramunicipal data is being used, ignoring largely realities in neighbouring municipalities and the role of the municipality in a larger territorial setting.*

	Probably, the approval of licences or building permits is taking place based on consultation of paper versions of the municipal plan.
Other user groups: National governments and partners in territorial cooperation	*According to some, it is higher planning tiers which are mostly interested in detailed planning information at lower levels. This is particularly the case for the Spanish national government. Although no spatial planning competencies exist at this level, they show interest in knowing how effective spatial planning is in dealing with sustainable development, for example regarding the uncontrolled expansion of urban areas, as shown by the SIU example (section 2.2.3.). This analysis might eventually lead to some new national policies trying to influence these tendencies.* *At European level, interest in planning data seems to refrain to general data on regional typologies, and differences of development paths between different European regions, at NUTS3 level in most detail. Navarra constitutes in itself a NUTS3 region. As such, this presents an interesting opportunity to share analysis and policy solutions, although the distance to real planning practice is quite large.* *International cooperation areas are often mentioned by Plan4all as a possible target group. However, few examples have been found where Navarra has been included in the real transnational use of spatial planning data. Often, cooperation projects are good at doing a cross border analysis (notwithstanding the difficulties to get comparable data), but we have not found a real use of these analysis in planning practices, apart from some punctual and very local experiences in border towns.*
Common requirements	*In technical terms:* • *Data views of spatial plans, both in stage of elaboration, as well as the final plan* • *Data views of geographical data which affects spatial planning (environmental limitations)* • *Data views of spatial plans of different administrative units, to compare different areas and different planning scales.* • *Analytical tools to do customized consultation* • *Tools to add comments and suggestions*
Spatial requirements	
Additional remarks	*In this section, we try to summarize the most important needs and proposals of the users we interviewed for more effective and widespread use of planning data.* *There is definitely a need for a more transparent accessibility of plans which are still in the phase of preparation. Better availability will enable both administration (other departments, other administrative levels) and society (citizens, interest groups, service providers)* ***to participate pro-actively in the elaboration of the plan****. However, this would require a change of planning culture from a hierarchical, bureaucratic practice to an open minded, transparent and participative way of planning.* *A claim which comes from all interviewees is to improve instant access to detailed information of all municipal and regional plans in a certain location, without the need to know the geographical extension of plans which possibly affect that particular site. There are many potential applications:* - *For municipalities and regional administration as* ***to improve new planning documents, avoiding overlap of conflicting planning units****)*

	- *For municipalities and regional administration **to raise transparency and efficiency in procedures** for issuing licences, building permits, etc.* - *For other departments to analyse existing plans in order **to design new policies**, such as for example measures against habitat fragmentation by the Department of Environment)* - *For project developers or utility managers **to anticipate investments** based on knowledge on detailed conditions of new project proposals.* *At a higher scale level, and probably more of a strategic nature, there is a need **to better understand possible synergies and conflicts between territorial and sectoral strategies of different levels**. Particularly the positioning of regional plans compared to strategies of neighbouring regions and of higher levels (Spain, Europe and territorial cooperation areas) is still poorly developed.* *In the case of Navarra, comparing existing territorial strategies would enable to reinforce efforts of the Working Group of the Pyrenees to define common strategies and development projects.*

Requirements according user groups	
Institution	*MAC, Ireland*
Collected by	*John O'Flaherty*
User Groups	***Requirements***
Spatial planning authorities	*At the top level of the Irish Spatial Planning System the Irish Government's Department of Environment Heritage and Local Government (DoEH&LG) is leading development of the Irish Spatial Data Infrastructure in accordance with INSPIRE principles and the Irish National Spatial Strategy.* • *Their requirements are to create awareness of INSPIRE and agreement of all interested parties relating to spatial planning in Ireland.* • *They also require further development of the ISDE (Irish Spatial Data Exchange) as a distributed architecture providing interoperability based on a light central mediation, and OGC/ISO19115 compliance to enable all user groups to search meta-data catalogues operated by all relevant agencies, and not just the 6 partner organisations who are currently involved in it.* *At the middle level of the Irish Spatial Planning System the Regional Authorities need interoperability to the higher level National strategic plans and the lower level implementation plans (which are in proprietary GIS systems at Regional and County level.* • *Again INSPIRE awareness and interoperability of these various systems is their major requirement.* *The Irish Local Authorities (County and City Councils) are at the core Spatial Planning implementation level. At this level there is much confusion, so their requirements are* • *Awareness of INSPIRE, its requirements and implications.* • *Support in making their relevant databases and mainly closed proprietary systems (mainly MapInfo, ArcGIS & GeoMedia products) open, interoperable and INSPIRE compliant.*

Other Civil Service authorities	*There are many agencies, and a number of GIS "power users" in this category, including:* • *Department of the Taoiseach (Prime Minister)* • *Department of Agriculture, Fisheries and Food* • *Marine Institute* • *Ordnance Survey Ireland (OSi)* • *Environment Protection Agency (EPA)* • *Geological Survey of Ireland (GSI)* • *Land Registry* • *Central Statistics Office (CSO)* *While these authorities have different statutory-defined objectives, they are all currently just getting to terms with the needs of INSPIRE, PSI and other EU Directives, and are beginning to explore the implications for their mainly proprietary (but generally very strong state-of-the-art) GIS systems.* • *Their main requirement is an INSPIRE-compliant, scaled-up and much more widely used ISDE.*
Owners of transport and technical infrastructure	• *Awareness, openness, accessibility and seamless interoperability are their major requirements.* ○ *These will be addressed through INSPIRE compliance particularly through use of a scaled-up ISDE.* • *This will need to interwork with other existing infrastructures, such as the GeoDirectory[1], EDEN (Environmental Data Exchange Network)[2] and specific widely used applications such as the LGBCSB's gPlan[3] system.*
Planning engineers, city planners	*This group is mainly employees of Local Authorities, as discussed above. Their specific needs tend to be more functional and technical, they tend to have better GIS tools and skills, but are not yet convinced of the value of INSPIRE, which many see as a distraction and another "burden from Brussels". So their needs are:* • *Awareness of INSPIRE and buy-into the value of its compliance.* • *Support in making their relevant databases and mainly closed proprietary systems open, interoperable and INSPIRE compliant.*
Firms	*In addition to the major GIS companies' vendors in Ireland, there are a number of firms involved in electronic spatial planning in Ireland. These include Compass[4], ESRI-Ireland[5]. ESBI Computing[6], MAC[7] and 1Spatial[8] for GIS software applications and Gamma[9] for spatial data.* • *Again their requirements are awareness of INSPIRE and its requirements (and commercial opportunities!).*

[1] www.geodirectory.ie/index.html
[2] www.edenireland.ie
[3] See www.lgcsb.ie
[4] www.compass.ie
[5] www.esri-ireland.ie
[6] www.esbic.ie
[7] www.mac.ie
[8] www.1spatial.ie
[9] www.gamma.ie/

NGO	*IRLOGI (Irish Organisation for Geographic Information) is perhaps the leading Spatial Planning NGO.* • *Their major requirement is support and endorsement in promoting awareness and adaptation of INSPIRE principles.*
Investors, real estate owners	*Open access to various relevant sources is their main requirement. The ISDE and INSPIRE openness and compliance will greatly enhance this for them.* • *They require reasonably priced, reliable and easy-to-use public and commercial sources that they can readily mash together with their own internal data to address their immediate queries and spatial planning needs.*
Real estate agents	*They also require reasonably priced, reliable and easy-to-use public and commercial sources that they can readily mash together with their own internal data to address their immediate queries and spatial planning needs.* • *But they need this on a ongoing lighter easy-to-access basis.*
Public	*Web access to Planning Applications, both for* *(a) Awareness, notification, searching and objecting to others' Applications, and* *(b) In-depth interaction with their Local Authority on developing and finalizing their own Application.* *Many Irish Councils provide public access to their Spatial Planning process using various Web-based tools. The most widely used is the LGCSB's gPlan system*[1]
Students	*Students studying GIS & Spatial Planning related topics will require access similar to the firms, NGOs, investors, real-estate people and public mentioned above.* *While students more directly involved in the Spatial Planning, process (such as the Coastal and Marine Resource Centre at UCC*[2]*) are actively involved in the ISDE and its development. So their needs will be more directly technical.*
Other group xxx	*Define other user group and relevant requirements, if it is necessary*
Other group xxx	*Define other user group and relevant requirements, if it is necessary*
Other group xxx	*Define other user group and relevant requirements, if it is necessary*
Common requirements	• *the basic functions of geographic information systems* • *common requirements on data combination* • *and their disclosure in the form of map projects (thin client, WMS or WFS), raster outputs or database descriptive data* • *INSPIRE awareness and acceptance.*
Spatial requirements	*List of special requirements from your point of view*
Additional remarks	*any additional remarks if necessary*

In Ireland the acute requirements across all User Groups are:

[1] See www.lgcsb.ie. In use in the Donegal, Galway, Mayo, Monaghan, Waterford, Wexford and Wicklow County Councils and available at their websites.

[2] http://cmrc.ucc.ie

- Open interoperable GI planning data and systems to overcome the current fragmented and disjointed sources.
- INSPIRE compliance of all sources.
- Overcome the current confusion and lack of awareness towards achieving these.

Requirements according user groups	
Institution	*MEEDDM, France*
Collected by	*François Salgé*
User Groups	***Requirements***
Spatial planning authorities	*Two authorities are involved* o *The municipality mayor* o *The prefecture (representing locally the state government)* *Their concern is two ford* 1. *in the process or creating and maintaining* o *view of the local spatial planning documents over their administrative and surrounding territory in conjunction with higher level spatial planning documents, orthophotos and other types of maps together with the relevant textual regualtion. It requires browsing via WMS service including queriing attribute data* o *validate spatial data that will be published over the Internet* 2. *during the process of building permits instruction* o *view the location of the building permit superimposed on the local spatial planning document;* o *identify the building permit requests that need a thorough scrutinising by his services.*
Other Civil Service authorities	*"instructor" is the person that will instruct the request and propose to the mayor the decision authorizing or not the building. His concern regarding the local spatial plans is whether or not the building is authorised including identifying the associated parties that need to be consulted. He requires:* o *View the location of the parcel to be built in conjunction with the local spatial planning documents, the publuic utility constraints, the orthophotos, the cadastral map.* o *Querry the displayed information to access the actual regulation part that apply to the parcel*
Owners of transport and technical infrastructure	*The "associated party" is the person that is consulted regarding the public utility constraints that may apply to the parcel. His concern is* o *locate the parcel where the building may be built* o *overlay the parcel over the public utility constraints he manage* o *check constraints is fulfiled or not*
Planning engineers, city planners	*Turning digital the existing local spatial plans.* o *The main issue is to superimposed the digital version (vector based) of the spatial planning document with the paper based document (that is the only one that bears authority) in order to check quality it means co-visualising scanned documents with vector based documents* *Planners survey how the built up areas develop through time* o *identify the areas where there is potentially rooms for new building* o *monitor the urban sprawl development* *both requires co-viewing with other type of geographical data*
Firms	
NGO	

Investors, real estate owners	
Real estate agents	
Public	*The "petitioner" while asking an authorisation to build something on a given parcel requires to know the rights and constraints that apply to his parcel* ○ *view the area where his parcel is located (orthophoto, spatial planning documents)* ○ *querry if they are constraints that apply to the parcel* ○ *check his projet meets the constraints*
Students	
Other group xxx	
Other group xxx	
Other group xxx	
Common requirements	○ *co-visualisation of spatial planning documents and other mapping documents such as orthophotos, current cadastral map* ○ *browse the spatial planning regulations that apply* ○ *"on-line" translation into mother toungue language*
Spatial requirements	○ *WMS and WFS servers* ○ *Location based querrying of textual documents*
Additional remarks	*These users are not really requesting metadata services BUT metadata is an essential part for the system to provide the services required by the above users.*

Requirements according user groups	
Institution	*Provincia di Roma (Provinciattiva), DipSU, Italy*
Collected by	*Filippo della Cananea, Flavio Camerata, Stefano Magaudda, Giuseppina Pellegrino*
User Groups	***Requirements***
Spatial planning authorities	• *Data preview within their administrative territory and "border zone" at local and regional level (as for the plan, the data preview means also the interconnection of attributes of the individual elements with the textual part of the plan, e.g. specific regulations related to individual areas).* • *Data management in form of geospatial database. This means that, since in every plan there are both themes managed by the authority responsible for the plan, and themes coming from other authorities, it would be useful for each authority to have dynamic links to the geodatabases managed by other authorities, rather than including these themes in its own database without the possibility of validating and updating it.* • *Data browsing and data editing via WFS-T service (Web Feature Service - Transactional) with the option of attribute and spatial questioning about geospatial data, with the purpose of final validation of planning data at any level. WFS-T service has bidirectional characteristics, which enable to manage data flows from the regional or provincial authorities to the municipalities and vice-versa, so efficiently supporting the shared validation of the planning data.*
Other Civil Service	• *Preview of the planning documentation in order to support the*

authorities	*negotiation phase, which is mandatory within the planning process; this gives an easier possibility for all authorities to publish their opinions about the ongoing planning choices.* • *Possibility for the Civil Defence Authorities to have a general and local overview of land use.*
Owners of transport and technical infrastructure	• *Data browsing and data editing via WFS-T service (Web Feature Service - Transactional) with the option of attribute and spatial questioning about geospatial data, with the purpose of harmonisation of planning instruments that still depend on separated decision lines.*
Planning engineers, city planners	• *Documentation preview.* • *Download of data, to be used as professional working material (with different levels of access according to the types of users - and also in line with INSPIRE: for example, the professionals pay for the data they use, the general public has a free but limited access, etc.) - Please note: access to SDI data cannot be provided, according to national laws, before the first step of the adoption of any territorial and urban plan.* • *Data & metadata catalogue, with possibility of listing and grouping the data under different classifications.* • *Discovery service, with search tools linked to all terms and information contained in metadata.* • *Catalogue of plans, comprising all relevant regulations and legal deliberations.* • *Possibility to view and overlay maps, adding themes from different databases; possibility to perform simple graphic operations such as buffering, drawing objects, measuring, etc.; possibility to print parts of the maps.* • *Possibility to download data in GIS-compatible formats.* • *WMS giving the possibility to work with local and remote data.*
Firms	*<Same as above>*
NGO	*<Same as above>*
Investors, real estate owners	*<Same as above>*
Real estate agents	*<Same as above>*
Public	• *Documentation preview.* • *Data & metadata catalogue, with possibility of listing and grouping the data under different classifications.* • *Discovery service, with search tools linked to all terms and information contained in metadata.* • *Catalogue of plans, comprising all relevant regulations and legal deliberations.* • *Map viewer (for general communication purposes).*
Students	• *Documentation preview.* • *Data & metadata catalogue, with possibility of listing and grouping the data under different classifications.* • *Discovery service, with search tools linked to all terms and information contained in metadata.* • *Catalogue of plans, comprising all relevant regulations and legal deliberations.* • *Map viewer (for general communication purposes).* • *Possibility to send electronic requests for geospatial data in the required formats (this could be better managed via University*

	services under specific Agreements with Spatial Planning Authorities).
Other group xxx	
Other group xxx	
Other group xxx	
Common requirements	
Spatial requirements	
Additional remarks	

Requirements according user groups	
Institution	*Georama, Greece*
Collected by	*Georama*
User Groups	***Requirements***
Spatial planning authorities	• *data management in form of geospatial database. For example at a national level a unified organization is established HEMCO, while at a local level special arrangements have been made at the city of Patras IT Department and a GIS and planning data office has been recently established.* • *data preview within each administrative territory and "border zone" at local and regional level* • *import of changes made by compilers into the unified data warehouse (revision control and comparison of contents of the data sets and their synchronizing)*
Building authorities	• *data preview (of the plans and planning materials at the local level, as well as the development principles – regional level in case that there is no plan)*
Owners of transport and technical infrastructure	• *easy import of geospatial data into local, regional and national database*
Planning engineers, city planners	• *documentation preview* • *map export for using as a material* • *metadata catalogue preview* *Notice:* ○ *Retrieval of engineer network data provided by their administrator is very limited. HEMCO at a national level will try to deliver a business model to satisfy all interested parties.* • *Planning engineers of the plans and planning studies are a special case – if they project the planning documentation or the planning studies, they can get the data*

Firms	• *documentation preview* • *metadata catalogue preview*
NGO	• *documentation preview* • *metadata catalogue preview*
Investors, real estate owners	• *documentation preview* • *metadata catalogue preview* • *preview of the "value" map* *Notice:* ○ *e-shops are already been proposed for this user group at the local level authorities; it would be possible to buy a map made up of layer combination of his choice of the Price map, Plan, etc. there*
Real estate agents	• *documentation preview* • *metadata catalogue preview* • *preview of the "value" map* *Notice:* ○ *e-shops are already been proposed for this user group at the local level authorities; it would be possible to buy a map made up of layer combination of his choice of the Price map, Plan, etc. there*
Public	• *documentation preview* • *metadata catalogue preview* *Notice:* ○ *documentation preview for general public should be enabled via web-based thin client that would be available at the respective authority server* • *Adding the comments into the map (user's graphics) at the time when the planning documentation is discussed* *Notice:* ○ *Users (citizens, public representative, owners) could be able to delimitate the area that the comment to the plan refers to*
Common requirements	• *the basic functions of geographic information systems* • *common requirements on data combination* • *and their disclosure in the form of map projects (web thin client), raster outputs or database descriptive data*
Additional remarks	*Authorities in Greece only share data though HTTP connections with third parties. Internally data is stored in Oracle and MS SQL Server databases, however usually the use of Web Services is necessary to access data externally due an extensive DMZ and firewalls!* *Of course this is not the case for data available on the web servers on URIs directly (e.g. textual data (doc pdf xls etc)).*

Requirements according user groups	
Institution	*Gijón City Council*
Collected by	*Agustín Lanero, Pedro López*
User groups	***Requirements***
Spatial planning authorities	• *Preview and search of the territory's data at a local and regional level (such as the General Spatial Planning and the steering plans of the Autonomous Region)* • *Management of geospatial databases* • *Data update and maintenance* • *Browsing via WMS service with the option of geospatial queries* • *Import of changes made by compilers, as well as import of data from external sources and in different formats.* • *Data export to different formats.*
Other Public authorities	• *Preview and search of the territory's data: spatial or environmental planning, land use, infrastructures, etc.*
Owners of transport systems and technical infrastructure	• *Easy import of data from external sources.* • *Development of convertion tools from data models* • *Update and maintenance ot the technological infrastructure.*
Spatial planning engineers, city spatial planners	• *Documentation preview via WMS servers with the option of searchin on geospatial data* • *Limited possibilities of editing for planning adjustments.*
Companies	• *Documentation preview* • *Metadata catalogue preview*
NGO	• *Documentation preview* • *Metadata catalogue preview*
Investors and real state owners	• *Documentation preview* • *Metadata catalogue preview* • *Access to your property's data by means of safe identification (electronic signature)*
Real state agents	• *Documentation preview* • *Metadata catalogue preview* • *Search of urban zoning.*
Public	• *Documentation preview via web-based on thin client.* • *Metadata catalogue preview* • *Availability of analysis functions on the data provided in the portal.*

	•
Students	• *Documentation preview via web-based on thin client* • *Metadata catalogue preview* • *Availability of analysis functions on the data provided in the poral.*
Common requirements	• *Common functions of Geographical Information Systems, mainly geospatial search and localizations.*
Spatial requirements	
Additional remarks	

Requirements according user groups	
Institution	*TDF (Technology Development Forum)*
Collected by	*Sarmite Barvika, Pēteris Brūns, Kaspars Skalbergs*
User Groups	***Requirements***
Spatial planning authorities	• *Data preview within their administrative territory and "border zone" at local and regional level (as for the plan, the data preview means also the interconnection of attributes of individual elements with the text part of the plan – regulations related to individual areas with different way of usage)* • *Data management (at our level it is the management of our own data) in form of geospatial database* • *Data browsing via WMS service with the option of attribute and spatial questioning about geospatial data.* • *Publishing of restricted volume of geospatial data to the compilers* • *Basic data processing;*
Other Civil Service authorities	• *Preview of the planning documentation in case of publishing opinions on the negotiated planning documentation;* • *Preview of the plan spatial representation;*
Owners of transport and technical infrastructure	• *Easy import of geospatial data into the database of Spatial planning Authority* • *Easy data atribute and spatial data update and management;*
Planning engineers, city planners	• *documentation preview* • *metadata catalogue preview* • *spatial data prewiew in technical data representation;* • *basic data processing*
Firms	• *documentation preview* • *metadata catalogue preview*
NGO	• *documentation preview* • *metadata catalogue preview*
Investors, real estate owners	• *documentation preview* • *metadata catalogue preview*
Real estate agents	• *documentation preview* • *metadata catalogue preview*

Public	• *documentation preview)* • *metadata catalogue preview*
Students	• *documentation preview* • *metadata catalogue preview*
Common requirements	• the basic functions of geographic information systems • basic data processing • common requirements on data combination • and their disclosure in the form of map projects (thin client, WMS or WFS), raster outputs or database descriptive data
Spatial requirements	
Additional remarks	

Requirements according user groups	
Institution	*EPF*
Collected by	*Stelian Dimitrov*
User Groups	***Requirements***
Spatial planning authorities	• *Data gathering* • *Data editing* • *Data management* • *Data browsing via WMS service with the option of attribute and spatial questioning about geospatial data.* • *Publishing basic geospatial data for the territory to the compilers* • *Import of changes made by compilers into the Cadastre database*
Other Civil Service authorities	• *Preview of the planning documentation;*
Owners of transport and technical infrastructure	• *To be able to import their databases and changes*
Planning engineers, city planners	• *To be able to use the planning documentation* • *To be able to use (extract) the planning maps* • *To be able to use the planning geospatial data (infrastructure, planning zones etc)*
Firms	• *To be able to use the planning documentation* • *To be able to use (extract) the planning maps*
NGO	• *To be able to preview the planning documentation* • *To be able to follow the history of the planning process (archive of maps) in order to guarantee the transparency of the planning within given teritory* • *To be able to use (extract) the planning maps*
Investors, real estate owners	• *To be able to use the planning documentation* • *To be able to use (extract) the planning maps*

	• *To be able to identify the status of their property*
Real estate agents	• *To be able to use (extract) the planning maps* • *To be able to identify the status of their property*
Public	• *To be able to use the planning documentation* • *To be able to use (extract) the planning maps*
Students	• *To be able to use the planning documentation* • *To be able to use (extract) the planning maps* • *To be able to use the planning geospatial data (infrastructure, planning zones etc) for educational purposes*
Other group xxx	*Define other user group and relevant requirements, if it is necessary*
Other group xxx	*Define other user group and relevant requirements, if it is necessary*
Other group xxx	*Define other user group and relevant requirements, if it is necessary*
Common requirements	• *Common requirements on data standards* • *Common requirements regarding interoperability and data combination* *Comment: The cadastre information is given in specific data format, called CAD4. The agricultural cadastre is provided in format called ZEM. They are not compliable with INSPIRE requirements and cannot be used with commercial GIS software. Also ther are problems with combination of the two formats.*
Spatial requirements	• *To be used standardized coordinate system* *Comment: At the moment all data, provided by the Cadastre agency and other public authorities is in local coordinate system, called 1970. This system was developed in the time of the Cold war, their parameters are known only by very small group of surveyors and its not included in the commercial GIS software packages.*
Additional remarks	*any additional remarks if necessary*

Requirements according user groups	
Institution	*ISOCARP*
Collected by	*Irene Rubitzki*
User Groups	***Requirements***
Spatial planning authorities	• *Data preview within their administrative territory and "border zone" at local and regional* • *Data management* • *Data viewing (showing other levels)* • *Data editing* • *Data browsing via WMS service with the option of attribute and spatial questioning about geospatial data.* • *Publishing of restricted volume of geospatial data to the compilers*
Other Civil Service authorities	• *Preview of the planning documentation in case of publishing opinions on the negotiated planning documentation;*

	• *Data management, viewing, editing, browsing and publishing*
Owners of transport and technical infrastructure	*Easy import and export of geospatial data into the database of spatial planning authority and infrastructure provider*
Planning engineers, city planners	• *documentation preview* • *map export for using as a material* • *metadata catalogue preview* • *Planning engineers of the plans and planning studies get data directly* • *Data browsing*
Firms	• *documentation preview* • *metadata catalogue preview*
NGO	• *documentation preview* • *metadata catalogue preview*
Investors, real estate owners	• *documentation preview* • *metadata catalogue preview* • *several states do have the possibility to e-shop – to my mind it should be free*
Real estate agents	• *documentation preview* • *metadata catalogue preview* • *several states do have the possibility to e-shop – to my mind it should be free*
Public	• *documentation preview (documentation preview for general public should be enabled via web-based thin client)* • *metadata catalogue preview* • *advanced Public users: Analytical functions option over the data within the portal – e.g. finding the projected areas for living, up to the distance of 5 km* • *Adding comments into the map after they are reviewed*
Students	• *documentation preview (documentation preview for general public should be enable via web-based thin client)* • *metadata catalogue preview* • *sending an electronic request for the geospatial data in the required extent* • *Analytical functions option over the data within the portal*
Other group xxx	
Other group xxx	
Other group xxx	
Common requirements	• *the basic functions of geographic information systems* • *common requirements on data combination* • *and their disclosure in the form of map projects (thin client, WMS or WFS), raster outputs or database descriptive data*
Spatial requirements	
Additional remarks	

Requirements according user groups	
Institution	*Zemgale Planning Region*
Collected by	*Dace Vilmane, Inga Berzina*
User Groups	***Requirements***

Spatial planning authorities	• *Data preview within their administrative territory and "border zone" at local and regional level (as for the plan, the data preview means also the interconnection of attributes of individual elements with the text part of the plan – regulations related to individual areas with different way of usage)* • *Data management (at our level it is the management of our own data) in form of geospatial database* • *Data browsing via WMS service with the option of attribute and spatial questioning about geospatial data.* • *Publishing of restricted volume of geospatial data to the compilers*
Other Civil Service authorities	• *Preview of the planning documentation in case of publishing opinions on the negotiated planning documentation;* •
Owners of transport and technical infrastructure	• *Easy import of geospatial data into the database of Spatial planning Authority* • *Possibility of dynamic conversion of the data models (import) of geospatial data of the technical infrastructure providers into the Olomouc City Council model. The goal is to implement the technological processes for the most automatic processing of the entry data from various, but known sources. Still, there is a risk of DM instability for data output on the part of providers.*
Planning engineers, city planners	• *documentation preview* • *metadata catalogue preview*
Firms	• *documentation preview* • *metadata catalogue preview*
NGO	• *documentation preview* • *metadata catalogue preview*
Investors, real estate owners	• *documentation preview* • *metadata catalogue preview*
Real estate agents	• *documentation preview* • *metadata catalogue preview*
Public	• *documentation preview)* • *metadata catalogue preview*
Students	• *documentation preview (documentation preview for general public should be enable via web-based thin client that would be available at the City Council server)* • *metadata catalogue preview*
Other group xxx	*Define other user group and relevant requirements, if it is necessary*
Other group xxx	*Define other user group and relevant requirements, if it is necessary*
Other group xxx	*Define other user group and relevant requirements, if it is necessary*
Common requirements	• *the basic functions of geographic information systems* • *common requirements on data combination* • *and theirdisclosure in the form of map projects (thin client, WMS or WFS), rastr outputs or database descriptive data*
Spatial requirements	

Additional remarks	*any additional remarks if necessary*

Requirements according user groups	
Institution	*CEIT ALANOVA*
Collected by	*Clemens Beyer, Julia Neuschmid*
User Groups	***Requirements***
Spatial planning authorities	*Authorities involved in spatial planning exist on national, state and local level. Core spatial planning in Austria happens on the local level (land use plan) where determinations from higher levels must be indicated and obeyed. Requirements at local level are:* ○ *free access to spatial planning related data (i.e. protected areas, reserved areas etc.) from higher administrational levels* ○ *data editing (only own data)* ○ *metadata catalogue maintenance* ○ *federal state or national geodatabase import and export access (to load, save and edit own plans)* ○ *interoperability of all spatial data at all administrational levels* ○ *standardisation of software and user interfaces* ○ *standardisation of data exchange formats* ○ *data publishing with restrictions for some user groups, but not for other authorities* *At the local level full access to all relevant datasets from higher levels is required as Austrian development plans on local level have to show all relevant non-local determinations. However, according to the current legal situation, this does not include access to planning data from neighbouring municipalities. There is no law and public authority in Austria regulating spatial planning on a regional level, therefore data is not automatically shared horizontally.*
Other Civil Service authorities	○ *metadata maintenance or metadata catalogue access (read and write)* ○ *geodata access as far as planning involvement is given (direct geodatabase access or via WFS)* ○ *standardisation of software and user interfaces* ○ *standardisation of data exchange formats* ○ *customisation of web map view (SLD)*
Owners of transport and technical infrastructure	○ *metadata catalogue access (read and write)* ○ *geodata access as far as planning involvement is given (direct geodatabase access or via WFS)* ○ *customisation of web map view (SLD)*
Planning engineers, city planners	○ *metadata catalogue access (read only)* ○ *geodata access as far as planning involvement is given (direct geodatabase access or via WFS)* ○ *extended geodata access when employed by a governmental authority* ○ *customisation of web map view (SLD)*
Firms	*Same as planning engineers as far as planning involvement is given.* *Same as public if no planning involvement is given.*
NGO	*Same as planning engineers as far as planning involvement is given.*

	Same as public if no planning involvement is given.
Investors, real estate owners	○ *same as public* ○ *access to full information for owned parcels (designation, constraints, restrictions,… down to cadastral level)*
Real estate agents	○ *same as public* ○ *access to full information for parcels dealt with (designation, constraints, restrictions,… down to cadastral level), granted by actual parcel owner*
Public	○ *metadata catalogue access (read only)* ○ *easy-to-use online access (WMS viewer, PDF download) to all plans which have legal obligation to be published* ○ *data browser, data preview* ○ *access to generalised information* ○ *online tools to send enquiries to the civil service authorities* ○ *extended rights may be granted based on these online tools (e. g. when asking for a building permit)* ○ *e-shop: data access for a fee*
Students	○ *metadata catalogue access (read only)* ○ *example data access (real or virtual data) for spatial planning students (like public authorities or like planning engineers, dependent on types of ongoing projects), giving them the possibility to act like in real business without being in danger to touch sensitive datasets.*
Common requirements	○ *metadata catalogue access (read only)* ○ *easy-to-use online access (WMS viewer, PDF download) to all plans which have legal obligation to be published* ○ *online shop for datasets which are available to the public for a fee (direct download or WMS system with user management)* ○ *INSPIRE compliancy of all data and metadata provided*
Special requirements	*Due to the small size of many municipalities, planning agenda are often carried out not by the municipality itself, but by external, privately owned planning offices or planning consultants being mandated by the municipality. In such cases, the requirements listed for spatial planning authorities are also valid for their contractors.*
Additional remarks	

ANNEX 3 Case study structure

1. Situation description

Please elaborate the case study from a position of your organization in spatial planning process. Try to describe each section of the study in several paragraphs, pictures and schemes are welcome. The study is NOT a questionnaire – the questions are only help (hints) for you, what you is the section about.

1.1. Political-administrative structure of the spatial planning (at the national, regional, local levels …) in your country/region

1.1.1. Levels and scope of spatial planning

Which levels (scales) of spatial planning do exist? What are the formal competences and objectives of spatial planning related activities at each of those levels? What planning documents are produced at each level?

1.1.2. Procedures

What formal steps are followed to elaborate every plan? Who executes and approves these formal steps? Who is involved in the creation of plans to what extent? How does public participation take place?

1.1.3. Users

What are current and potential users and user groups in each level of spatial planning?
Who are the users of planning data and how do they use it?

- *politics and public administration on the level that implements the plans (that have to install and adminstrate plans)*
- *politics and administration on other spatial/hierarchical levels (their scope of action can be influenced by the plans from other levels)*
- *planners (as experts, service providers to administration or other user groups)*
- *citizens (that are affected by plans)*
- *(potential) investors (that have to know what is allowed/not allowed in a certain setting, what can be done, so that they can calculate if it is profitable for them)*
- *interest groups, NGOs, ...*
- *other public and private data users / experts / service providers, i.e. geo-marketing-companies, map-makers, ...*
- *researchers, students*

Where are the actual users located? - Only within the region or are there users from outside (other regions, international) and how do they use planning data / information?
What do the users want - so why do they use the planning data - and do they actually get what they want?
Who could be additional users and what prevents them from already using the data?

1.2. Processes in spatial planning

Which spatial data are used for what purpose in the planning processes described under 1.1.2? Is a legal framework which determines which data should be collected and exposed in the planning procedure? What are the shortcomings in the actual use of spatial data for planning purposes at different levels?

1.3. Characteristics of Spatial Planning Data

1.3.1. Data format

What are typical data formats, how the data is usually stored?

1.3.2. Quantity and Quality of Content

Check and update the table in DoW page14

1.4. Technology in spatial planning

1.4.1. Data standards and data models

Which data models and standards do you use in Spatial Planning process? Who is initiator of these data models? Is the use of standardised data models in Spatial planning processes regulated by law or just a recommendation?

1.4.2. SW facility

What SW do you typically use for data gathering, maintenance, updating and publishing?

1.4.3. Technological process

What technology do you typically use for data gathering, maintenance, updating and publishing?

1.4.4. Technological data accessibility

Describe the style of data transfer at the individual levels and data publishing – Is data available for target users in analogue or digital form (data medium/email/web application/web service)? Is the same data used on different levels? How?
Does the data-access work fine or are there any problems - why/where?
If the available datasets are "under-used" at the moment, why do you think this is the case?

- *data not available for the users who could make use of it?*
- *no info/knowledge that the data is available?*
- *technical hurdles, data formats, access regulations, rights management, ...*

Are there technical hurdles that prevent the usage of the data?
Do you have any experience with Spatial Planning data interoperability and harmonization on international level?
Is the planning system and are the available data comparable to the neighbouring regions?
So could they be applications using planning data that do not only cover your region (the case-study-region) but a bigger area? (why / why not)

Are (or could) the available data be used in cross-border-applications and compared / processed with data from other countries? (why / why not)

1.4.5. Metadata

Are they collected? Is any metadata standard used?

1.4.6. INSPIRE

Are the INSPIRE principles exploiting? How?

1.5. Digital Right Managements

1.5.1. IPR an business models

Which IPR models and business model are used in your region/country for Spatial planning data?

1.5.2. Data availability

Which kinds of data are available for public with free access, which data with registration, with limited access, with access for a fee? Are there legislative hurdles that prevent the usage of the data?

1.6. Other Description issues

Describe, from your point of view, the other important Description issues in this section.

2. User requirements and proposals

The Plan4all is focused on the standardisation, harmonisation and processing of geospatial data. Vertical and horizontal data interoperability represents the main project task. The possibility to use the same data in different administrative levels (vertical) or use the data from other subjects on the same level (horizontal) is one from important project goals.

2.1. Requirements

Please specify the requirements in these sections also with respect to user groups that you should define in section 1.1.3. Users .Specify potential requirements of additional users - What could be done / what could the data be used for and why is it not used for that purposes at the moment?

2.1.1. Requirements on interoperability

What are your requirements on the standardization – harmonization – interoperability on the local/regional/cross border levels?

2.1.2. Requirements on data models

What are your requirements on data model, with respect to Plan4all goals?

2.1.3. Requirements on metadata

What are your requirements on metadata?

2.2. Designs

From your point of view and with respect to these Plan4all goals, specify:

2.2.1. Minimum data set

What is for the minimum data set for standardization process in both, horizontal and vertical levels

2.2.2. Preferable data model and dataflow

- in creating, management, up-dating and publishing of Spatial Planning data, especially with relation to INSPIRE principles

2.2.3. Plans regarding metadata

Are you going to use it, in which time, which standard, specify individual metadata items important for you

2.2.4. Ideas regarding Digital Right Management

What solution you prefer for individual administrative levels or involved subjects

2.3. Other Requirement Issues

Describe, from your point of view, the other important Requirement issues in this section.

3. Bottlenecks

Describe advantages and disadvantages of your solution
Describe potential problems with realization of the Plan4all tasks or your proposed ideas