

INSPIRE from the JRC Point of View

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Abstract: This paper summarises some recent developments in INSPIRE implementation from the JRC (Joint Research Centre) point of view. The INSPIRE process started around 11 years ago and today, clear results and benefits can be seen. Spatial data are more accessible and shared more frequently between countries and at the European level. In addition to this, efficient, unified coordination and collaboration between different stakeholders and participants has been achieved, which is another great success. The JRC, as a scientific think-tank of the European Commission, has played a very important role in this process from the very beginning. This role is in line with its mission, which is to provide customer-driven scientific and technical support for the conception, development, implementation and monitoring of European Union (EU) policies. The JRC acts as the overall technical coordinator of INSPIRE, but it also carries out the activities necessary to support the coherent implementation of INSPIRE, by helping member states in the implementation process. Experiences drawn from collaboration and negotiation in each country and at the European level will be of great importance in the revision of the INSPIRE Directive, which is envisaged for 2014.

Keywords: spatial data infrastructure (SDI), INSPIRE, development, Joint Research Centre (JRC)

1 Introduction

The INSPIRE initiative was launched in 2001, with the intention of providing harmonised sources of spatial information in support of the formulation, implementation and evaluation of community policies (Annoni 2006). It relates to the base of information collected within member states (MS) in order to respond to a wide range of policy initiatives and obligations at local, regional, national and international levels. This information is often already in existence, but cannot be exploited within a broader context, due to the fragmentation of current monitoring systems definition and implementation.

Three years later, after intensive consultations between the MS and their experts, a stakeholders' consultation, and an assessment of the likely impacts of INSPIRE, the European Commission (Commission, EC) adopted the INSPIRE proposed directive in July 2004 (European Commission 2004). The INSPIRE proposal was subject to an extended impact assessment (URL 1, URL 2) to identify potential costs and benefits before opening it up to public consultation. The revised proposal was

then debated by the Council of Europe (Council), the European Parliament and the Commission over a three-year period before the final directive was agreed. Directive 2007/2/EC of the European Parliament and of the Council establishing an Infrastructure for Spatial Information in the European Community (INSPIRE, Directive) was published in the Official Journal on 25 April 2007 and entered into force on 15 May 2007 (European Commission 2007). The INSPIRE Directive lays down general rules for the establishment of an infrastructure for spatial information in Europe, based on National Spatial Data Infrastructures (NSDIs) established and operated by the MS.

In 2002, a Memorandum of Understanding (MoU) was signed on cooperation between the DG Environment (Directorate-General for the Environment), Eurostat and the Joint Research Centre (JRC) for the first steps in the development of the INSPIRE initiative (Annoni 2011). In 2006, the three DGs signed an updated MoU that outlined roles and responsibilities, working arrangements, and cooperation mechanisms up to the end of the policy development phase in 2013. It was agreed that a key success factor for the implementation of the Directive would be the

INSPIRE iz perspektive JRC-a

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Sažetak: U radu je prikazano aktualno stanje u implementaciji INSPIRE-a iz perspektive JRC-a (Joint Research Centre, Zajednički istraživački centar). INSPIRE proces započeo je prije 11 godina i danas su vidljivi jasni rezultati i koristi. Prostorni podaci su dostupniji i više se razmjenjuju između pojedinih zemalja i na europskoj razini. Osim toga, ostvarena je učinkovita i jedinstvena koordinacija i suradnja između različitih subjekata i sudionika što je također velik uspjeh. JRC kao "znanstveni mozak" Europske komisije ima vrlo važnu ulogu u INSPIRE procesu od njegova početka. Ta je uloga u skladu s misijom JRC-a, a to je pružanje znanstvene i tehničke podrške u osmišljavanju, razvoju, implementaciji i praćenju politika Europske unije (EU). JRC je tehnički koordinator INSPIRE-a i zadužen je za pružanje podrške zemljama članicama u dosljednoj implementaciji INSPIRE-a. Iskustva u kolaboraciji i pregovorima s pojedinim zemljama kao i na europskoj razini imaju važnu ulogu u reviziji INSPIRE direktive, koja je predviđena u 2014. godini.

Ključne riječi: infrastruktura prostornih podataka (IPP), INSPIRE, razvoj, Zajednički istraživački centar (Joint Research Centre, JRC)

1. Uvod

INSPIRE inicijativa pokrenuta je 2001. godine radi povećanja dostupnosti harmoniziranih izvora prostornih informacija, a u svrhu podrške formulaciji, implementaciji i evaluaciji politika Europske unije (Annoni 2006). Inicijativa se odnosila na osnovne prostorne informacije koje se prikupljaju u zemljama članicama i koje se mogu koristiti u širokom rasponu različitih političkih inicijativa i obveza na lokalnoj, regionalnoj, nacionalnoj i međunarodnoj razini. Takve informacije najčešće već postoje, ali ih je teško pronaći zbog velike razjedinjenosti u postojećim sustavima.

Tri godine poslije, nakon intenzivnih konzultacija između zemalja članica, stručnjaka i subjekata, te provedenih procjena učinaka, Europska komisija prihvatila je prijedlog INSPIRE direktive (Infrastructure for Spatial Information in the European Community) u srpnju 2004. godine (European Commission 2004). Prijedlog je bio podvrgnut daljnjoj proširenoj procjeni utjecaja (URL1, URL 2) u svrhu identificiranja potencijalnih troškova i koristi, a nakon toga su obavljene i javne konzultacije. Revidirani prijedlog razmatrali su Vijeće Europe i

Europska komisija u daljnjem trogodišnjem razdoblju prije nego što je usuglašena konačna verzija. INSPIRE direktiva 2007/2/EC donesena je 25. travnja 2007. godine, a stupila je na snagu 15. svibnja 2007. godine (European Commission 2007). Direktiva daje generalne smjernice za uspostavu Europske infrastrukture prostornih podataka (EIPP), temeljene na nacionalnim infrastrukturama prostornih podataka (NIPP-ovima) zemalja članica.

Godine 2002. dogovoren je Memorandum o razumijevanju između Opće uprave za okoliš (Directorate-General for the Environment, DG Environment), Statističkog ureda Europske unije (Eurostat) i Zajedničkog istraživačkog centra (JRC) radi podrške uspostavi INSPIRE inicijative (Annoni 2011). Memorandum je dopunjen 2006. godine s točno definiranim ulogama, ugovornim obavezama i mehanizmima za suradnju za razdoblje do 2013. godine. Sve strane usuglasile su mišljenja kako je ključan faktor za implementaciju INSPIRE direktive jasno definiranje uloge i odgovornosti te učinkovitih koordinacijskih mehanizama kako bi se osigurala dosljednost u implementaciji INSPIRE-a. DG Environment je nadležan za legislativu i političku koordinaciju. Eurostat je koordinator za implementaciju i podršku u razvoju

identification of durable and precise roles and responsibilities for each of the leading services, along with efficient and effective coordination mechanisms to ensure coherence throughout the INSPIRE implementation process. The DG Environment acts as the overall legislative and policy co-ordinator for INSPIRE, while Eurostat is the overall implementation co-ordinator and supports IR (implementation rules) developments on data and service sharing and on monitoring and reporting. The JRC acts as the overall technical coordinator of INSPIRE, and is responsible for the development of IRs for metadata, data specification and network services. The three collaborating DGs also made a commitment to continued openness and transparency with respect to the different communities involved in the implementation of INSPIRE.

This paper summarises some important milestones and recent developments in INSPIRE implementation. Particular attention is paid to the role of the JRC in this process. In addition, a glossary of the most commonly used terms in the INSPIRE process is provided at the end of the paper.

2 The INSPIRE Process

The INSPIRE Directive serves to establish the necessary infrastructure for spatial information within the EU, in order to ensure the better integration of environmental policy and other policies. INSPIRE responds to the need for quality georeferenced information to support an understanding of the complexity of, and interactions between, human activities and environmental pressures and impacts. It addresses the current general situation with respect to spatial information in Europe, where there is an urgent need to fill in gaps in availability and eliminate the duplication of information collection, as well as compensate for the fragmentation of existing datasets and sources. All these problems make it difficult to identify, access and use currently available data, to the detriment of environmental integration, given the importance of data in regard to a number of policy and information topics spanning various levels of public authority. The INSPIRE Directive is complementary to related policy initiatives, such as the Directive on the Re-use of Public Sector Information (European Commission 2003a), which is currently under revision, and the Directive on Public Access to Environmental Information (European Commission 2003b).

The purpose of INSPIRE is to support environmental policy and overcome major barriers still affecting the availability and accessibility of relevant data. These barriers include (Craglia 2010):

- Inconsistencies in spatial data collection, whereby spatial data is often missing or incomplete, or the same data is collected by different organizations
- Lack of or incomplete documentation on available spatial data
- Lack of compatibility among spatial datasets that cannot therefore be combined with others
- Incompatible SDI initiatives within a MS that often function only in isolation
- Cultural, institutional, financial, and legal barriers preventing or delaying the sharing of existing spatial data

The key elements of the INSPIRE Directive to overcome these barriers include:

- Metadata to describe existing information resources so data can be found and accessed more easily
- Harmonization of key spatial data themes needed to support environmental policies in the European Union
- Agreements on network services and technologies to allow discovery, viewing, and downloading information resources and access to related services
- Policy agreements on sharing and access, including licensing and charging
- Coordination and monitoring mechanisms

INSPIRE addresses 34 key spatial data themes organized in three groups (or Annexes to the Directive), reflecting the different levels of harmonization expected and staged phasing (Table 1).

Annexes I and II focus on reference data, while Annex III focuses on data for environmental analysis and impact assessment.

The Directive does not require new data collection and does not impose any obligation on data providers to change existing workflows. By enabling interoperability, data can be used coherently, independent of whether an existing dataset is actually transformed (harmonised) permanently or is only temporarily transformed by a network service in order to publish it within INSPIRE.

2.1 Obligations of Member States

The deadline for MS for transposing the INSPIRE Directive into national legislation was 15 May 2009 (URL 3). Transposition has proven difficult, as most national adoptions have experienced one to two years of delay. In more detail, obligations include these key tasks:

1. Planning:
 - Identify spatial datasets that meet the conditions established under Article 4 (1) of the Directive
 - Identify the national authorities that hold such data

provedbenih pravila za dijeljenje i razmjenu prostornih podataka te praćenje i izvješćivanje. JRC je tehnički koordinator INSPIRE-a i zadužen je za izradu provedbenih pravila za metapodatke, interoperabilnost podataka i mrežne usluge. Također je dogovorena otvorenost i transparentnost procesa te uključivanje različitih zajednica u implementaciju INSPIRE-a.

Ovaj rad daje sustavan pregled najvažnijih koraka i trenutačnih postignuća u razvoju i implementaciji INSPIRE-a. Posebni naglasak dan je ulozi JRC-a u tom procesu. Na kraju rada dan je rječnik najčešće korištenih pojmova u INSPIRE procesu.

2. INSPIRE proces

INSPIRE direktiva donesena je u svrhu stvaranja potrebne infrastrukture prostornih podataka (IPP) u EU kako bi se osigurala bolja integracija politike o okolišu s drugim politikama. INSPIRE odgovara potrebama za kvalitetnim georeferenciranim informacijama za podršku razumijevanju kompleksnosti i interakcije između ljudskih aktivnosti i pritiska te utjecaja na okoliš. INSPIRE obuhvaća generalnu situaciju s obzirom na prostorne informacije u Europi, gdje postoji hitna potreba za ispunjavanjem praznina u dostupnosti i eliminaciji dupliciranja prikupljanja informacija, kao i za rješavanjem razjedinjenosti postojećih skupova podataka i izvora. Svi navedeni problemi otežavaju identifikaciju podataka, pristup podacima i korištenje podataka koji su dostupni, na štetu integracije okoliša, s obzirom na važnost podataka za velik broj politika i tema na različitim razinama javne vlasti. INSPIRE direktiva je u suglasju s drugim povezanim inicijativama kao npr. Direktivom o višestrukoj upotrebi informacija javnog sektora (European Commission 2003a) koja se trenutačno nalazi u reviziji, i s Direktivom o javnom pristupu informacijama o okolišu (European Commission 2003b).

Svrha INSPIRE-a je podrška politici okoliša i prevladavanje osnovnih barijera koje još uvijek sprečavaju dostupnost i pristup relevantnim podacima. Te barijere uključuju (Craglia 2010):

- nekonzistentnost skupova prostornih podataka, gdje podaci vrlo često nedostaju ili su nekompletni i gdje se isti podaci redundantno prikupljaju od strane različitih organizacija
- nepostojanje ili nekompletna dokumentacija o dostupnosti prostornih podataka
- nekompatibilnost između skupova prostornih podataka što onemogućuje njihovo međusobno kombiniranje

- nekompatibilnost IPP-inicijativa u zemljama članicama EU koje su često izolirane
- kulturne, institucionalne, financijske i legislativne barijere koje sprečavaju ili otežavaju razmjenu postojećih prostornih podataka.

Ključni elementi INSPIRE direktive koji bi trebali pomoći u rješavanju navedenih barijera su sljedeći:

- metapodaci za opisivanje postojećih informacijskih resursa kako bi se olakšalo pretraživanje i pristup podacima
- harmonizacija ključnih tema prostornih podataka potrebnih za podršku politici okoliša u EU
- sporazumi o mrežnim uslugama i tehnologijama koji će omogućiti pretraživanje, pregled i preuzimanje informacija i pristup povezanim uslugama
- sporazumi o politici dijeljenja i razmjene, uključujući licenciranje i naknade
- mehanizmi za koordinaciju i praćenje.

INSPIRE obuhvaća 34 teme prostornih podataka organizirane u tri skupine (odnosno priloga direktive) s obzirom na različite razine očekivane harmonizacije i faze razvoja (tablica 1).

Prilozi I i II odnose se na osnovne podatke, dok Prilog III obuhvaća tematske podatke za analize i procjenu utjecaja na okoliš.

Direktiva ne zahtijeva prikupljanje novih prostornih podataka i ne postavlja nikakve obveze s obzirom na postojeće poslovne procese pružatelja podataka. Omogućavanjem interoperabilnosti podaci se mogu dosljedno koristiti neovisno o tome da li su podaci trajno transformirani (harmonizirani) ili se trenutačno transformiraju s pomoću mrežnih usluga kako bi se mogli publicirati unutar INSPIRE-a.

2.1. Obveze zemalja članica

Rok za transpoziciju INSPIRE direktive u nacionalna zakonodavstva zemalja članica bio je 15. svibnja 2009. (URL 3). Transpozicija je bila otežana i u nekim slučajevima s kašnjenjem od jedne do čak dvije godine. Detaljnije obveze zemalja članica uključuju neke bitne zadaće:

1. Planiranje
 - identificiranje skupova prostornih podataka koji ispunjavaju uvjete propisane u članku 4 (1) direktive
 - identificiranje nadležnih institucija koje su odgovorne za navedene podatke
 - identificiranje međunarodnih normi i standarda te postojećih inicijativa vezanih uz metapodatke
 - identificiranje subjekata za potrebe navedene u članku 22 (1) direktive i procjena potreba korisnika.

- Identify international standards, especially with respect to the validation of metadata and any existing initiatives
- Identify stakeholders for the purposes of Article 22 (1) of the Directive and assess user requirements.

2. Regulation:
 - Regulate the collection and dissemination of all spatial data that fulfil the conditions stipulated under Article 4 of the Directive and establish metadata for spatial datasets and services
 - Establish by law a competent authority or authorities
 - Formulate legal instruments with implementation rules for the interoperability and harmonisation of spatial data
 - Establish under national legislation a network of services for spatial datasets and services for which metadata have been created and provide for its operation
 - National legislation must set obligations to facilitate data sharing
3. Training and Capacity Building:
 - Prepare and publish guidance on the duties and roles of the various stakeholders
 - Provide technical training for officers in public authorities involved in the provision of spatial data services in order to optimise their services
4. Monitoring and Reporting:
 - Provide information at regular intervals at the national level and set up an infrastructure to handle requests by the public or public authorities, whether national or from another MS
 - Set up the necessary infrastructure to report to the Commission

Table 1. Data themes of INSPIRE

Annex I

1. Coordinate reference systems
2. Geographical grid systems
3. Geographical names
4. Administrative units
5. Addresses
6. Cadastral parcels
7. Transport networks
8. Hydrography
9. Protected sites

Annex II

10. Elevation
11. Land cover
12. Orthoimagery
13. Geology

Annex III

14. Statistical units
15. Buildings
16. Soil
17. Land use
18. Human health and safety
19. Utility and governmental services
20. Environmental monitoring facilities
21. Production and industrial facilities
22. Agricultural and aquaculture facilities
23. Population distribution and demography
24. Area management /restriction/ regulation zones & reporting units
25. Natural risk zones
26. Atmospheric conditions
27. Meteorological geographical features
28. Oceanographic geographical features
29. Sea regions
30. Bio-geographical regions
31. Habitats and biotopes
32. Species distribution
33. Energy resources
34. Mineral resources

These tasks are not only being considered in MS but also in candidate and potential candidate countries. This is especially important for Croatia as an acceding country (Cetl et al. 2009a; Poslončec-Petrić et al. 2011) which will have to adhere to the general INSPIRE timetable immediately upon accession.

2.2 INSPIRE Components and Current Status

The legal framework of INSPIRE has two main levels (URL 4). At the first level, there is the INSPIRE Directive itself, which sets the objectives to be achieved and asks the MS to pass their own national legislation establishing their NSDIs. This mechanism of European plus national legislation allows each country to define its own means of achieving the objectives agreed upon, taking into account its own institutional characteristics and history of development. At the second level of legislation, INSPIRE envisages technical implementing rules in the form of regulations. These are actually the main components of infrastructure:

2. Regulacija

- reguliranje prikupljanja i diseminacije svih prostornih podataka koji ispunjavaju uvjete propisane u članku 4 direktive i uspostavu metapodataka za prostorne podatke i usluge
- zakonsku uspostavu nadležnog tijela ili više njih
- formuliranje legalnih instrumenata za provedbena pravila u svrhu interoperabilnosti i harmonizacije prostornih podataka
- uspostavu mrežnih usluga, propisanih zakonski, za prostorne podatke i usluge za koje su izrađeni metapodaci i osiguravanje njihove dostupnosti
- propisati obveze koje će olakšati razmjenu prostornih podataka.

3. Obuka i izgradnja kapaciteta

- priprema i objava smjernica o ulozi i zadaćama različitih subjekata
- pružanje tehničke podrške zaposlenicima javnih institucija uključenih u pružanje prostornih podataka i usluga te optimiranje njihovih usluga.

4. Praćenje i izvješćivanje

- pružanje informacija u redovitim vremenskim razdobljima na nacionalnoj razini i uspostavu infrastrukture koja će odgovarati zahtjevima između pojedinih javnih tijela na nacionalnoj razini i razini EU
- uspostavu potrebne infrastrukture u svrhu izvješćivanja Europske komisije.

Navedenim obvezama i zadaćama nisu samo obuhvaćene zemlje članice, već i zemlje kandidati te potencijalni kandidati. To je od posebne važnosti i za Hrvatsku kao zemlju pristupnicu (Cetl et al. 2009a; Poslončec-Petrić i dr. 2011) koja će odmah nakon ulaska u EU morati slijediti generalni vremenski plan INSPIRE-a.

2.2. INSPIRE komponente i trenutačno stanje

Zakonodavni okvir INSPIRE-a ima dvije osnovne razine (URL 4). Na prvoj se nalazi sama INSPIRE direktiva, koja definira ciljeve što ih treba postići i zahtijeva od zemalja članica uspostavu nacionalne legislative za njihove NIPP-ove (nacionalne infrastrukture prostornih podataka). Takav mehanizam Europske i nacionalne legislative omogućuje svakoj zemlji da samostalno definira način na koji će postići zadane ciljeve uzimajući u obzir njezine specifične institucionalne karakteristike i povijesni razvoj. Na drugoj razini, INSPIRE uvodi provedbena regulacijska pravila koja zapravo čine osnovne komponente infrastrukture:

- metapodaci
- interoperabilnost prostornih podataka i usluga
- mrežne usluge (pretraživanje, pogled, preuzimanje i poziv) dostupne kroz INSPIRE geoportal

- razmjena podataka i usluga
- koordinacija i mjere za praćenje i izvješćivanje.

Od 2005. godine, paralelno s radom na INSPIRE direktivi, nekoliko predlagačkih timova (Drafting Teams – DTs) započelo je s radom na izradi provedbenih pravila (Implementing Rules – IRs). Također je od 2008.

Tablica 1. INSPIRE teme prostornih podataka

Prilog I

1. Referentni koordinatni sustavi
2. Sustavi geografske mreže
3. Geografski nazivi
4. Upravne jedinice
5. Adrese
6. Katastarske čestice
7. Prometne mreže
8. Hidrografija
9. Zaštićene lokacije

Prilog II

10. Visine
11. Prekrivenost tla
12. Ortofotografija
13. Geologija

Prilog III

14. Statističke jedinice
15. Zgrade
16. Tlo
17. Korištenje zemljišta
18. Ljudsko zdravlje i sigurnost
19. Komunalne i državne usluge
20. Sustavi za nadzor okoliša
21. Postrojenja za proizvodnju i industriju
22. Objekti i strojevi za poljoprivredu i akvakulturu
23. Raširenost stanovništva - demografija
24. Područja upravljanja/zaštićena područja/uređena područja i jedinice za izvješćavanje
25. Područja s prirodnim opasnostima
26. Atmosferski uvjeti
27. Meteorološko-geografske značajke
28. Oceanografsko-geografske značajke
29. Morske regije
30. Biogeografske regije
31. Staništa i biotopi
32. Raširenost vrsta
33. Izvori energije
34. Izvori minerala

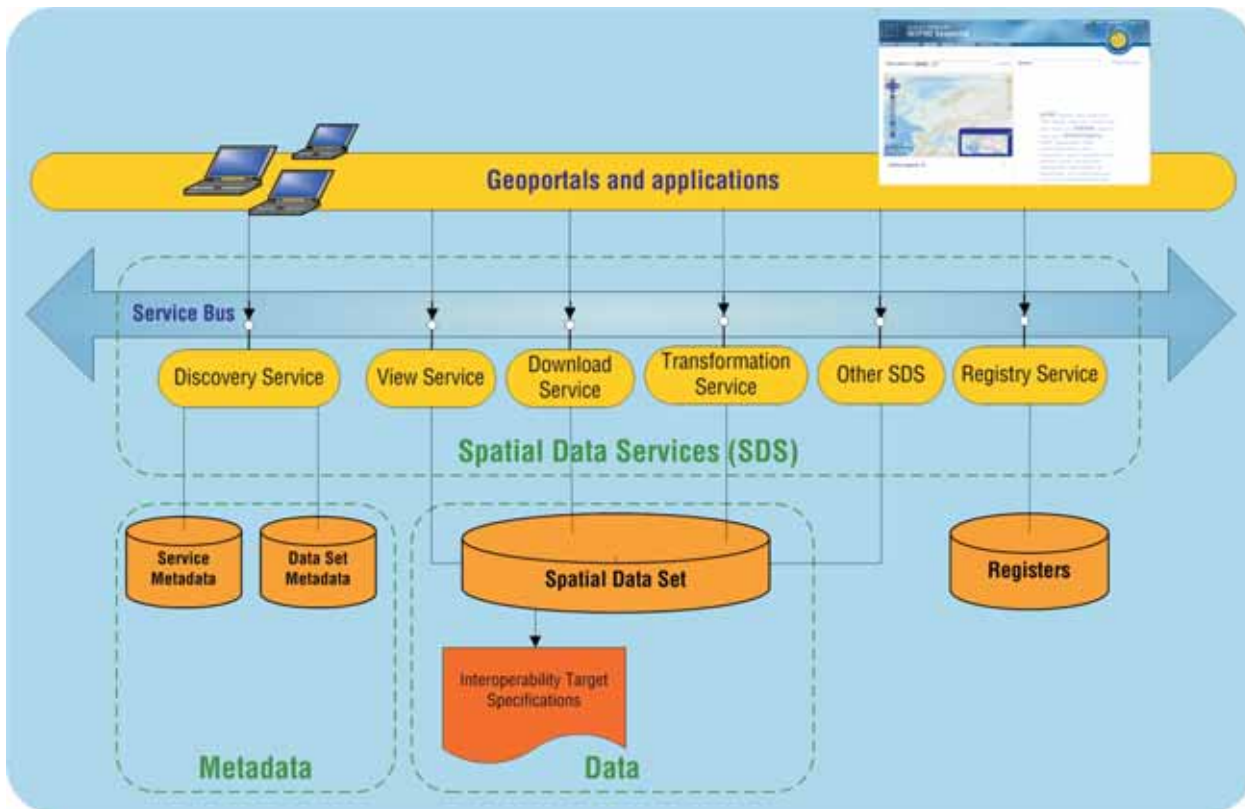


Figure 1. INSPIRE architecture overview

- Metadata
- Interoperability of spatial data sets and services
- Network services (discovery, view, download, invoke) made available through the INSPIRE geoportal
- Data and service sharing
- Coordination and measures for monitoring and reporting

From 2005 onwards, and in parallel with activities to prepare the INSPIRE Directive, several drafting teams (DTs) have started to elaborate implementing rules (IRs). In addition, several thematic working groups (TWGs) have been elaborating data specification for the different themes of the three annexes of the Directive since 2008. All the IRs take the form of a decision or regulation and must be implemented by individual member states once they are published. Each IR is accompanied by technical guidelines (TG) which, in addition to providing general support for implementation, may give directions on how to further improve interoperability.

2.2.1 Metadata

The INSPIRE Metadata Regulation entered into force on 24 December 2008 (European Commission 2008). By

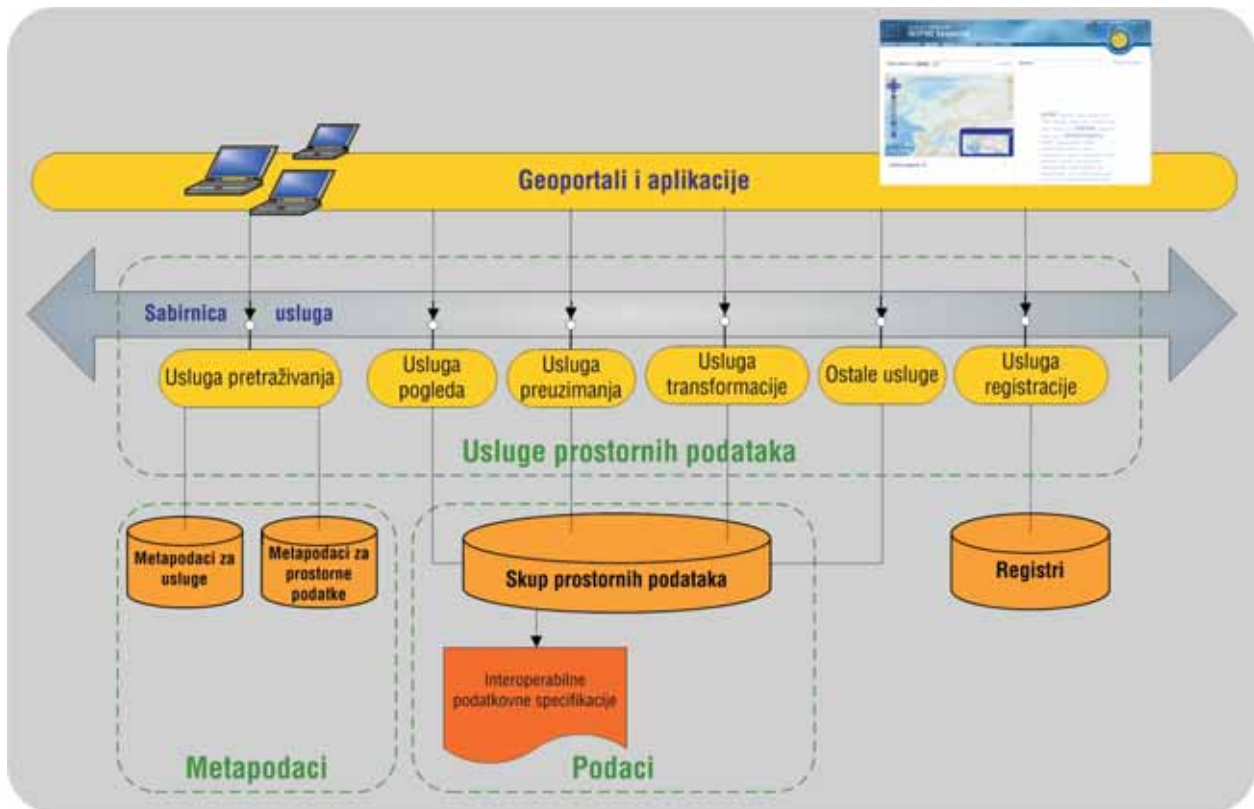
December 2010, MS must provide the metadata for data sets and services listed in Annex I and II of the Directive. A revised version of the TG to implement the Regulation using EN ISO 19115 Metadata and EN ISO 19119 Services was also published on the INSPIRE web site in June 2010 (URL 4).

2.2.2 Network Services

Figure 1 gives an overview of INSPIRE architecture with common network services. Network services are necessary for sharing spatial data between the various levels of public authority in the community.

2.2.2.1 Discovery Services and View Services

The INSPIRE Network Services Regulation (European Commission 2009a) was adopted by the Commission on 19 October 2009. It contains the implementing rules for discovery and view services. The TG Discovery Services (Version 3.1) and the INSPIRE View Service TG (Version 3.1), were prepared by the Network Services Drafting team and published on the INSPIRE web site on 7 November 2011 (URL 4).



Slika 1. INSPIRE arhitektura

godine započelo s radom nekoliko tematskih radnih skupina (Thematic Working Groups – TWGs) na izradi podatkovnih specifikacija za različite teme iz tri priloga direktive. Sva provedbena pravila objavljuju se u obliku odluke ili propisa i moraju se provoditi u zemljama članicama. Svako je provedbeno pravilo upotpunjeno s tehničkim smjernicama (Technical Guidelines – TG), koje dodatno pružaju podršku implementaciji i poboljšavaju interoperabilnost.

2.2.1. Metapodaci

INSPIRE provedbena pravila za metapodatke stupila su na snagu 24. prosinca 2008. godine s rokom od dvije godine za zemlje članice u kojem moraju pružiti metapodatke za prostorne podatke i usluge iz Priloga I i II direktive. U lipnju 2010. godine objavljene su na INSPIRE web-stranici i revidirane tehničke smjernice za implementaciju provedbenih pravila u skladu s normama EN ISO 19115 i EN ISO 19119 (URL 4).

2.2.2. Mrežne usluge

Na slici 1 dan je pregled INSPIRE arhitekture i pripadnih mrežnih usluga. Mrežne su usluge nužne za raz-

mjenu prostornih podataka između različitih razina javne vlasti u EU.

2.2.2.1. Usluge pretraživanja i pogleda

INSPIRE provedbena pravila za mrežne usluge prihvaćena su 19. listopada 2009. godine (European Commission 2009a). Tehničke smjernice za usluge pretraživanja i usluge pogleda (verzija 3.1) objavljene su na INSPIRE web-stranici 07. studenoga 2011. godine (URL 4).

2.2.2.2. Usluge preuzimanja i transformacije

Dopunjena provedbena pravila za mrežne usluge koja uključuju usluge preuzimanja i transformacija objavljena su 10. prosinca 2010. godine (European Commission 2010a). Na INSPIRE web-stranici (URL 4) postavljene su i pripadne tehničke smjernice:

- Tehničke smjernice za usluge transformacije koordinata (V 2.1, 15/03/2010) koje daju preporuke i smjernice za implementaciju usluga transformacija koordinata sukladno INSPIRE-u
- Tehničke smjernice za usluge transformacije sheme (V3.0, 15/12/2010) koje daju preporuke i smjernice

2.2.2.2 Download Services and Transformation Services

Commission Regulation (European Commission 2010a) No 1088/2010 of 23 November 2010 amending Regulation (EC) No 976/2009 as regards download services and transformation services was published in the Official Journal on 10 December 2010.

On the INSPIRE web site (URL 4), accompanying TG documents were published:

- TG Coordinate Transformation Services, (V 2.1, 15/03/2010), that identifies recommendations and implementation guidelines for the coordinate transformation services to fulfil the INSPIRE Directive
- TG Schema Transformation Services (V3.0, 15/12/2010), that identifies the recommendations and implementation guidelines for the schema transformation services
- TG Download Services (V 2.0), that identifies recommendations and implementation guidelines for the download services to fulfil the INSPIRE Directive. This document is currently being revised by the Initial Operating Capability (IOC) Task Force.

2.2.2.3 Initial Operating Capability Task Force

The Initial Operating Capability Task Force (IOC TF) was set up in June 2009 to help and support Member States in the implementation of INSPIRE services and to ensure interoperability with the INSPIRE geoportal of the EC. The IOC TF consists of representatives from all MS, responsible for the architecture, design and service implementation of the NSDIs. All information relating to the IOC TF can be found on the INSPIRE web site (URL 4).

2.2.3 Data Specifications

Commission Regulation No 1089/2010 (European Commission 2010b; European Commission 2011) of 23 November 2010 implementing Directive 2007/2/EC of the European Parliament and of the Council as regards interoperability of spatial data sets and services has been published. This Regulation concerns the interoperability of spatial data sets for Annex I spatial data themes.

TGs for the spatial data themes of Annex I are available on the INSPIRE web site (URL 4). Also available are the framework documents for the INSPIRE data specifications development, updated to reflect experience with Annex I data themes.

Following a call for expression of interest for participation in development of INSPIRE data specifications for

Annex II & III Data Themes, launched in November 2009, nineteen INSPIRE TWGs were established to develop the INSPIRE data specifications. Around 190 of the 330 experts proposed by the stakeholders were appointed as members of the TWGs.

INSPIRE data specifications reached an important milestone in June 2011 with the delivery by the TWGs of the Data Specifications Version 2.0 for Annex II & III Data Themes, the launch of stakeholder consultation and start of testing the proposed specifications. Success in reaching this point while respecting tight deadlines was due to the expertise, dedication and commitment of all the experts involved and the support they received from their organisations. Objections received during the consultation and testing period have been resolved, and the Implementing Rule Legal Act for Annex II and III has been drafted. The draft is currently under revision by the services of the Commission. When exactly the INSPIRE Committee will express an opinion on the proposed legal act depends on when the translations will be available (late 2012, or early 2013). The 3.0 versions of the draft TGs for all 25 themes covered in INSPIRE Annexes II and III were published on the INSPIRE web site on 16 July 2012.

2.2.4 Data and Service Sharing

The Commission Regulation implementing Directive 2007/2/EC of the European Parliament and of the Council as regards the access to spatial data sets and services of the member states by community institutions and bodies under harmonised conditions was adopted on 29 March 2010 (European Commission 2010c).

Guidelines for data and service sharing are available on the INSPIRE website (URL 4). These guidelines should help in the understanding and implementation of this commission regulation. Also, a "good practice" document is available, with the aim of illustrating how INSPIRE sharing principles can be applied to data and service sharing between MS.

2.2.5 Monitoring and Reporting

On 5 June 2009, the Commission Decision implementing Directive 2007/2/EC of the European Parliament and of the Council as regards monitoring and reporting was adopted (European Commission 2009b).

A document explaining the rationale of the selected indicators, as well as guidelines and a Microsoft Excel template for reporting, have been developed and made available. These documents can be found on the INSPIRE

za implementaciju usluge transformacije podatkovne sheme

- Tehničke smjernice za usluge preuzimanja (V 2.0) koje daju preporuke i smjernice za implementaciju usluge preuzimanja. Dokument se u vrijeme pisanja ovog rada nalazi u reviziji operativne skupine za inicijalnu operativnu sposobnost (The Initial Operating Capability Task Force – IOC TF).

2.2.2.3 Operativna skupina za inicijalnu operativnu sposobnost (IOC TF)

Skupina je uspostavljena u lipnju 2009. godine u svrhu pomoći i podrške zemljama članicama u implementaciji INSPIRE usluga i u osiguravanju interoperabilnosti s INSPIRE geoportalom Europske komisije. Skupina se sastoji od predstavnika zemalja članica koji su zaduženi za arhitekturu i dizajn implementacije NIPP-a u pojedinoj zemlji. Detaljnije informacije o radu ove skupine dostupne su na INSPIRE web-stranici (URL 4).

2.2.3. Specifikacije podataka

Provedbena pravila za interoperabilnost skupova prostornih podataka i usluga objavljena su 23. studenoga 2010. godine (European Commission 2010b, EUROPEAN COMMISSION 2011). Njima su obuhvaćena pravila za interoperabilnost skupova prostornih podataka u Prilogu I INSPIRE direktive.

Tehničke smjernice za prostorne podatke iz Priloga I dostupne su na INSPIRE web-stranici. Također su dostupni okvirni dokumenti koji sadrže iskustva u radu s podacima u Prilogu I.

Nakon poziva za iskaz interesa za sudjelovanje u razvoju INSPIRE specifikacija za prostorne podatke u Prilogu II i III, koji je pokrenut u studenome 2009. godine, 19 radnih skupina uspostavljeno je radi izrade specifikacija podataka. Od predloženih 330 stručnjaka njih 190 je imenovano za članove radnih skupina.

INSPIRE specifikacije podataka dosegnule su vrlo važan trenutak u lipnju 2011. godine s isporukom Specifikacija podataka iz priloga II i III (verzija 2.0) od strane radnih skupina i s pokretanjem konzultacija sa zainteresiranim subjektima i testiranjem predloženih specifikacija. Za uspjeh u postizanju te aktivnosti unutar zadanih rokova zaslužni su prije svega stručnjaci i njihova posvećenost i predanost radu kao i podrška koju su imali od svojih organizacija. Komentari dobiveni kroz konzultacije i testiranje uzeti su u obzir u izradi radne verzije Provedbenih pravila za prostorne podatke iz priloga II i III. Radna

verzija se u vrijeme pisanja rada nalazi na reviziji unutar Europske komisije. Konačno mišljenje i prijedlog Vijeća INSPIRE-a (INSPIRE Committee) očekuje se krajem 2012. ili početkom 2013. godine. Tehničke smjernice za svih 25 tema prostornih podataka (verzija 3.0) objavljene su na INSPIRE web-stranici 16. lipnja 2012. godine.

2.2.4. Razmjena podataka i usluga

Provedbena pravila za pristup skupovima prostornih podataka i uslugama u zemljama članicama i institucijama EU-a prihvaćena su 19. ožujka 2010. godine (European Commission 2010c).

Smjernice za razmjenu podataka i usluga dostupne su na INSPIRE web-stranici (URL 4). Smjernice bi trebale pomoći u razumijevanju i provedbi navedenih provedbenih pravila. Također je dostupan i dokument „dobra praksa“, koji prikazuje kako se mogu primijeniti principi razmjene podataka u INSPIRE-u između zemalja članica.

2.2.5. Praćenje i izvješćivanje

Provedbena pravila za praćenje i izvješćivanje prihvaćena su 05. lipnja 2009. godine (European Commission 2009b).

Dotadno je izdano pojašnjenje o opravdanosti odabranih indikatora te smjernice i predložak u Microsoft Excelu za izvješćivanje. Navedeni dokumenti dostupni su na INSPIRE web-stranici (URL 4). Praćenje na kvantitativnoj osnovi provodi se na godišnjoj osnovi, dok se izvješća koja pokrivaju više kvalitativne aspekte zahtijevaju svake tri godine.

Prve dokumente o praćenju i izvješćivanju o INSPIRE-u dostavile su Europskoj komisiji zemlje članice 2010. godine. Dokumenti se provjeravaju i javno su dostupni na INSPIRE web-stranici (URL 4).

Na INSPIRE web-stranici je također dostupno šesto izdanje izvješća o trenutnom stanju (State of Play) koje pokriva razdoblje od 2010. do 2011. godine. Ta izvješća izradilo je Katoličko sveučilište Leuven zajedno sa skupinom uglednih međunarodnih stručnjaka. Izvješće obuhvaća i prve rezultate praćenja zemalja članica koji su dostavljeni Europskoj komisiji 2010. godine.

2.2.6. INSPIRE geoportal

JRC je početkom 2012. pustio u rad prvo izdanje operativnog INSPIRE geoportala (slika 2). Rok zemljama članicama za uspostavu servisa pretraživanja i pogleda bio je studeni 2011. godine. Ta verzija geoportala bazirana je na prethodnom prototipu, koji je dodatno

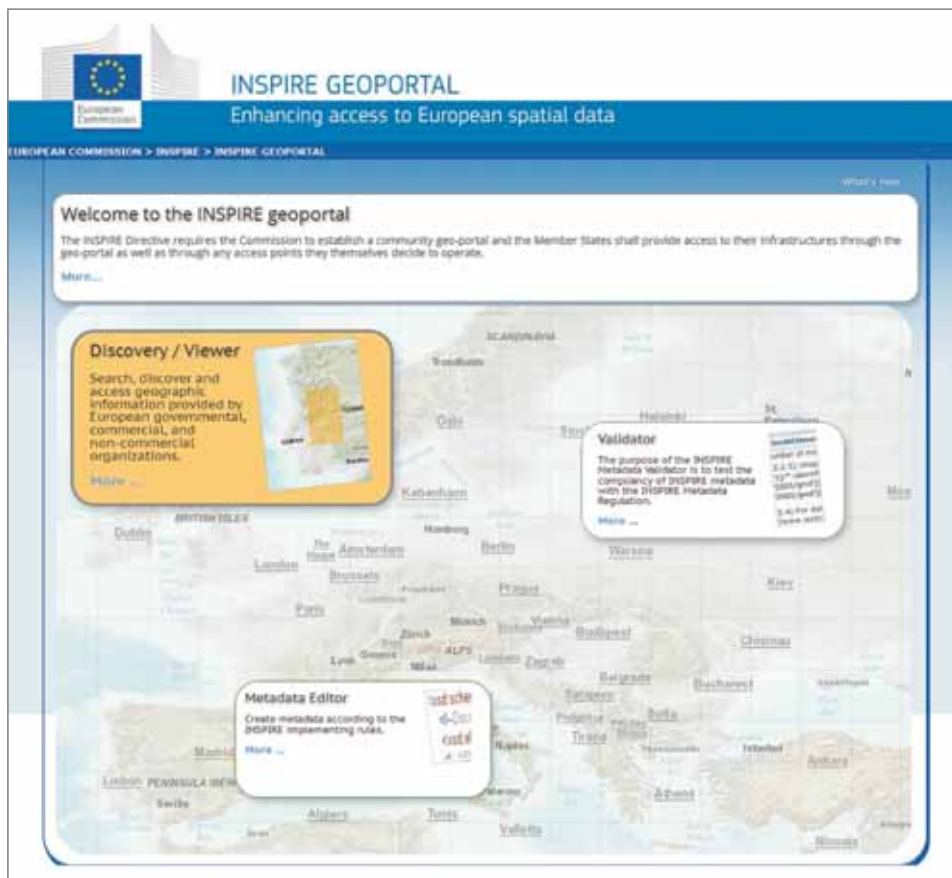


Figure 2. INSPIRE geoportal (URL 6)
Slika 2. INSPIRE geoportal (URL 6)

website in the section on monitoring and reporting. Monitoring on a quantitative basis takes place annually and reports covering more qualitative aspects are required every three years.

In 2010, the first INSPIRE monitoring and reporting documents were provided by MS to the EC. These documents are currently being evaluated and are available on the INSPIRE website (URL 4).

The 6th edition of the State of Play reports, covering the period 2010 – 2011, is also available on the INSPIRE website. This study was conducted by the Katholieke Universiteit Leuven, along with a group of international experts. It also takes into account the first results of the MS monitoring activities submitted to the EC in 2010, in compliance with the INSPIRE Directive.

2.2.6 INSPIRE Geoportal

The deadline for member states to provide discovery and view services in operational mode, according to the INSPIRE regulation on network services was November

2011, and the first release of the operational INSPIRE geoportal has since been published (Figure 2). The INSPIRE geoportal is based on previous JRC work on a prototype version, but further enhances user experience for searching and discovering metadata across Europe in a multilingual environment.

The INSPIRE geoportal provides the means for searching spatial data sets and spatial data services and, subject to access restrictions, viewing and downloading spatial data sets from the EU MS within the framework of the INSPIRE Directive. This version of the INSPIRE geoportal allows the discovery and viewing of spatial data sets and services. Also the INSPIRE metadata editor is accessible via the INSPIRE geoportal.

Additional functions are envisaged in subsequent releases, while at the same time, the operational INSPIRE geoportal assigned to a company is under development.

3 Role of the JRC

The role of European Commission's Joint Research Centre (JRC) in INSPIRE is in line with its mission, which

poboljšani i omogućuje lakše pretraživanje i otkrivanje metapodataka diljem Europe u višejezičnom okruženju.

INSPIRE geoportal omogućuje pretraživanje prostornih podataka i usluga te, ovisno o eventualnim ograničenjima, pogled i preuzimanje prostornih podataka iz zemalja članica u okviru INSPIRE-a. Na INSPIRE geoportalu je također omogućena izrada, uređivanje i provjera metapodataka.

Dotadne funkcionalnosti geoportala predviđene su u idućim verzijama, a daljnji je razvoj prepušten vanjskoj tvrtki.

3. Uloga JRC-a

Uloga Zajedničkog istraživačkog centra (Joint Research Centre – JRC) Europske komisije u INSPIRE-u je u skladu s njegovom misijom pružanja znanstvene i tehničke podrške u osmišljavanju, razvoju, implementaciji i praćenju politika EU. Kao servis Europske komisije, JRC funkcionira kao referentni centar za znanost i tehnologiju u EU. JRC služi kao podrška u donošenju politika u EU štiteći zajedničke interese zemalja članica neovisno o bilo čijim interesima, privatnim ili nacionalnim.

Unutar JRC-a u Institutu za okoliš i održivi razvoj (Institute for Environment and Sustainability – IES) nalazi se Odjel za digitalnu Zemlju i referentne podatke (Digital Earth and Reference Data Unit – DERD), u daljnjem tekstu Odjel. Prethodni naziv Odjela bio je Odjel za infrastrukture prostornih podataka, a u siječnju 2012. ime je promijenjeno u sadašnje. Novo ime Odjela u skladu je sa strateškim pravcima razvoja koji su postali relevantni za Odjel (Annoni i dr. 2011; Craglia i dr. 2012), uključujući i Digitalnu agendu za Europu (URL 5).

Radi ostvarenja INSPIRE-a, Odjel djeluje kao sveobuhvatan znanstveno-tehnički koordinator INSPIRE-a, osiguravajući pritom razmjenu informacija između predlagačkih timova, tematskih radnih skupina i operativne skupine za inicijalnu operativnu sposobnost. Odjel podupire veću uključenost zainteresirane IPP-zajednice (Spatial Data Interest Communities – SDIC) u razvoj INSPIRE-a i osigurava međutematsku harmonizaciju. Odjel također sudjeluje u izradi provedbenih pravila i različitih INSPIRE servisa (npr. geoportal, registri, tehničke smjernice, ...).

Odjel usko surađuje i u različitim međunarodnim inicijativama i organizacijama kako bi osigurao povezanost INSPIRE-a sa sličnim infrastrukturama koje se razvijaju diljem svijeta, npr. Globalno praćenje za okoliš i sigurnost (Global Monitoring for Environment and Security – GMES) i druge aplikacije u području praćenja okoliša. Odjel također sudjeluje u radu međunarodnih

tijela za normizaciju i standardizaciju (npr. ISO/TC211, CEN/TC287 i OGC) za potrebe INSPIRE-a i odgovoran je za tehničku koordinaciju s drugim relevantnim međunarodnim inicijativama. Interoperabilnost i razmjena podataka ključni su čimbenici u ostvarenju vizije INSPIRE-a. Dijeljenje i razmjena podataka podrazumijeva web-pristup i ostale usluge koje su utemeljene na otvorenim i standardiziranim sučeljima i kodiranju.

U početku, Odjel je bio odgovoran za pripremu provedbenih pravila za metapodatke, specifikacije podataka, mrežne usluge i interoperabilnost te razvoj i stalnu dogradnju INSPIRE geoportala i tehničku koordinaciju s ostalim inicijativama EU-a i međunarodnim inicijativama. U međuvremenu uloga Odjela se povećala i ona danas obuhvaća i mnoge druge aspekte INSPIRE-a u razvoju i implementaciji te u upravljanju, koordinaciji i komunikaciji sa zainteresiranom IPP-zajednicom i zakonski odgovornim organizacijama u zemljama članicama (Legally Mandated Organisations – LMO).

U vrijeme pisanja rada Odjel je izvodio dva projekta: SHAPE i ENABLE. Oba projekta pridonose razvoju INSPIRE-a, ali u različitim segmentima.

3.1. SHAPE

Razmjena politika o okolišu ili SHAPE (Sharing Policies for Environment) obuhvaća znanstvene, tehničke i organizacijske aktivnosti koje su potrebne za formulaciju INSPIRE legislative odnosno provedbenih pravila za interoperabilnost prostornih podataka i usluga, mrežnih servisa te za podršku rastu šire INSPIRE zajednice kroz INSPIRE forum (URL 7).

Specifični su ciljevi SHAPE-a:

- koordinacija razvoja INSPIRE-a i provedbenih pravila kroz poticanje sudjelovanja i izgradnju kapaciteta između subjekata i održavanje veza s istraživačkom zajednicom
- podrška razvoju politike za Dijeljeni informacijski sustav o okolišu (Shared Environmental Information System – SEIS) u suradnji s Općom upravom za okoliš, Statističkim uredom Europske unije i Europskom agencijom za okoliš (European Environment Agency – EEA)
- podrška Globalnom praćenju za okoliš i sigurnost kroz koordinaciju i održavanje veze između INSPIRE-a i ostalih strateških inicijativa vezanih uz standardizaciju prostornih podataka
- podrška razvoju međunarodnih interoperabilnih IPP-inicijativa (GEOSS, GMES, UN-SDI, Digital Earth, GSDI i African SDI)
- unapređivanje istraživanja u semantičkoj interoperabilnosti i procjena utjecaja IPP-a.

is to provide customer-driven scientific and technical support for the conception, development, implementation and monitoring of EU policies. As a service of the EC, the JRC functions as a reference centre for science and technology across the Union. Close to the policy-making process, it serves the common interest of the MS whilst being independent of special interests, whether private or national.

Within the JRC, Digital Earth and Reference Data Unit (DERD; hereinafter: the Unit) in the Institute for Environment and Sustainability (IES), is responsible for INSPIRE. In January 2012, the previous name of the Spatial Data Infrastructures Unit was changed to the Digital Earth and Reference Data Unit. The new name alludes to the new policy orientations that have become relevant for the Unit (Annoni et al. 2011; Craglia et al. 2012), including the Digital Agenda for Europe (URL 5).

In order to make INSPIRE a reality, the Unit acts as the overall scientific-technical coordinator of INSPIRE, guaranteeing the exchange of information between INSPIRE DTs, TWGs and the IOC TF. The Unit facilitates the involvement of Spatial Data Interest Communities in the development of INSPIRE, ensures cross-thematic harmonisation for the preparation of INSPIRE implementing rules, and develops and upgrades prototype services for European components (a European geoportals, registries, guidelines, etc).

The Unit also liaises with international initiatives and organisations to ensure that INSPIRE is well connected with similar infrastructures developed in different regions of the world, and that it can make the best use of satellite-based data collection (as envisaged in Global Monitoring for Environment and Security – GMES) and applications in the field of environmental monitoring. The Unit also initiates and monitors work with international standardisation bodies (e.g. ISO/TC211, CEN/TC 287 and OGC) for the purposes of INSPIRE, and is responsible for technical coordination with other relevant international initiatives. Interoperability and data sharing are essential to achieving the INSPIRE vision. Information sharing by means of web access to data and services depends on open, consensus-derived standard interfaces and encodings.

Originally, the Unit was responsible for the preparation of the INSPIRE IR for metadata, data specifications, network services and interoperability, as well as the development and upgrading of the INSPIRE geoportals and technical coordination with other EU and international initiatives. In the meantime, however, the role of the Unit has evolved and it is now responsible

for other aspects of INSPIRE development and implementation, including the management and coordination of communication with spatial data interest communities (SDIC) and legally mandated organisations (LMO).

Currently, the Unit is running two actions, SHAPE and ENABLE, both of which contribute to INSPIRE, but which focus on different parts of the policy cycle.

3.1 SHAPE

Sharing Policies for the Environment (SHAPE) undertakes the scientific, technical, and organisational activities necessary for the formulation of INSPIRE daughter legislation, i.e. the INSPIRE implementing rules for the interoperability of spatial datasets and services, and network services, as well as supporting the growth of the INSPIRE “broader community” through the evolving INSPIRE forum (URL 7).

The specific objectives of the action are:

- To coordinate the development of the INSPIRE Directive and its implementing rules by fostering participation and capacity-building activities in the stakeholder community, and maintaining links with the research community
- To support the policy development of the Shared Environmental Information System (SEIS) in collaboration with DG Environment, EUROSTAT, and the European Environmental Agency (EEA)
- To support GMES by coordinating and maintaining the link with INSPIRE and other strategic geo-spatial standardisation initiatives
- To support the interoperable development of international SDI initiatives (GEOSS, GMES, UN-SDI, Digital Earth, GSDDI and the African SDI)
- To advance research in semantic interoperability and impact assessment for spatial data infrastructures

INSPIRE is a collection of several data themes. The interoperability target must be defined for each of them in the form of interoperability or data specifications. In order to achieve cross-theme interoperability, a robust framework has been developed, known as the conceptual framework (Tóth et al. 2012). The purpose of the conceptual framework is to reinforce common technical measures, efficient information exchange, and standardised methodology for data specification development across the infrastructure. Based on the experience of INSPIRE, this framework has two components: the generic conceptual model and specification development methodology.

INSPIRE obuhvaća više tema prostornih podataka. Za svaku od njih potrebno je definirati interoperabilnost u obliku podatkovnih specifikacija. Kako bi se postigla međutematska interoperabilnost razvijen je robustan okvir poznat kao konceptualni okvir (Tóth i dr. 2012). Njegova je svrha osigurati zajedničke tehničke mjere, učinkovitu razmjenu informacija i standardiziranu metodologiju u razvoju podatkovnih specifikacija unutar infrastrukture. Na temelju iskustva s INSPIRE-om, taj okvir ima dvije osnovne komponente: opći konceptualni model i metodologiju razvoja specifikacija podataka.

3.2. ENABLE

Implementacija i razvoj informacijskih sustava o okolišu (Environmental Information Systems Implementation and Evolution – ENABLE) obuhvaća aktivnosti potrebne za dosljednu implementaciju INSPIRE-a kroz podršku zemljama članicama s provedbenim pravilima te razvoj zajedničkih komponenti INSPIRE arhitekture (npr. geoportal, registri i dr.). Kroz taj projekt također se podupire rad Operativne skupine za inicijalnu operativnu sposobnost i provode se procjene društvenog i ekonomskog učinka implementacije INSPIRE-a.

Specifični su ciljevi ENABLE-a:

- koordinacija i razvoj INSPIRE geoportala
- podrška razvoju i implementaciji INSPIRE provedbenih pravila u zemljama članicama
- podrška implementaciji Dijeljenog informacijskog sustava o okolišu u suradnji s Općom upravom za okoliš, Statističkim uredom Europske unije i Europskom agencijom za okoliš
- provođenje tehničkog vodstva u implementaciji INSPIRE-a unutar Instituta za okoliš i održivi razvoj JRC-a
- podrška razvoju potrebnih komponenti u svrhu interoperabilnosti međunarodnih IPP-inicijativa (GEOS, GMES, ISDE, GSDI i African SDI)
- davanje doprinosa u razvoju nove generacije digitalne Zemlje kroz demonstraciju mogućnosti primjene javnih prostornih informacija u kontekstu prirodnih katastrofa.

3.3. Izazovi

INSPIRE i uspostava NIPP-ova u pojedinim zemljama je proces (Cetl et al. 2009b) i mnogo toga je već odrađeno, međutim još uvijek postoje neki otvoreni izazovi kao i prilike (Craglia 2010):

- INSPIRE je infrastruktura koja se temelji na NIPP-ovima trenutačno 27 različitih zemalja i 23 jezika. Ta činjenica postavlja vrlo visok zahtjev u pogledu višejezičnih servisa i interoperabilnost između različitih informacijskih sustava te profesionalne i kulturne prakse. Razvoj i održavanje takve infrastrukture koja će pritom stvarati dodanu vrijednost je veliki izazov. Također je potreban balans jer su neke zemlje članice otišle već puno dalje od drugih
- postojeće norme i standarde treba testirati u realnom distribuiranom i višejezičnom okruženju
- neki standardi i norme još uvijek ne postoje i tek ih treba razviti
- neki standardi i norme nisu dovoljno jasni i ostavljaju previše prostora za različite interpretacije, što zahtijeva njihovo redefiniranje
- organizacijski izazovi u zemljama članicama i održavanje visoke razine uključenosti IPP-subjekata u INSPIRE-u
- izgradnja kapaciteta.

Što se tiče vremenskog okvira implementacija INSPIRE direktive ulazi u novu fazu jer se težište pomiče s Europske komisije na zemlje članice (Masser 2012), a što će svakako biti velik izazov.

4. Zaključak

Nakon 11 godina od prvih početaka i 5 godina od formalnog usvajanja, danas su vidljivi jasni rezultati i koristi od uvođenja INSPIRE-a. Svakoga dana sve više prostornih podataka u skladu s INSPIRE-om postaje dostupno diljem EU-a, npr. Europski servis prostornih podataka o tlu (Feiden i dr. 2011). Podaci možda još uvijek nisu u potpunosti harmonizirani, jer je proces tek na početku, ali podaci su dostupni i omogućeno je njihovo pretraživanje i pregled. Potkraj 2012. godine korisnicima bi trebao biti omogućen i stvaran pristup podacima i usluge preuzimanja što će biti još jedan veliki korak u uspostavi europskog IPP-a. U INSPIRE proces uključeno je nekoliko stotina stručnjaka i ljudi iz prakse iz čitave Europe. Kompleksnost suradnje bazirane na dobrovoljnoj osnovi zasigurno predstavlja inovaciju ne samo u razvoju IPP-a već i općenito u formuliranju javne politike na razini Europe.

Glavni subjekti u pojedinim zemljama kao i na europskoj razini su već „inspirirani“ INSPIRE-om, što je pokrenulo i neke druge inicijative. U javnom je sektoru podignuta razina svijesti čime se potiču pojedinci i organizacije da preispitaju svoju ulogu i odgovornost prema podacima za koje su nadležni.

Pogled je trenutačno jasno fokusiran na zemlje članice. Njihova iskustva u implementaciji INSPIRE-a u

3.2 ENABLE

Environmental Information Systems Implementation and Evolution (ENABLE) carries out the activities necessary to support a coherent implementation of INSPIRE by helping MS with the INSPIRE IRs on metadata and network services and by developing the Community components of INSPIRE architecture (e.g. geoportals, registries, etc.) and evaluating the socio-economic impact of implementation. This action also facilitates the IOC TF.

The specific objectives of the action are:

- To coordinate the development of the INSPIRE geoportals
- To support the development and implementation of the INSPIRE implementing rules in the member states
- To support the policy implementation of the Shared Environmental Information System (SEIS) in collaboration with DG Environment, EUROSTAT, and the European Environmental Agency (EEA)
- To provide the technical lead in implementing INSPIRE within the IES
- To support the development of components necessary for the interoperability of international SDI initiatives (GEOSS, GMES, ISDE, GSDI and African SDI)
- To contribute to the development of the next generation Digital Earth, by demonstrating how spatial information volunteered by the public can be quality assessed and used to complement official sources in the context of natural hazards.

3.3 Challenges

INSPIRE and NSDI implementation in MS (Cetl et al. 2009b) is a process and lot of work has been already done. However, there are still some challenging issues and opportunities (Craglia 2010):

- INSPIRE is an infrastructure currently built by 27 different countries using more than 23 languages. This results in very high demands for multilingual services and interoperability among very different information systems and professional and cultural practices. The development and maintenance of an infrastructure that works and delivers added value is the main challenge. There is also a need to find a balance, because some MS are not as far advanced as others;
- Existing standards have to be tested in real distributed and multilingual settings

- Some standards do not yet exist and need to be developed
- Some standards are not mature enough, or leave too much room for different interpretations, and thus require further redefinition
- Organizational challenges in MS to continue to maintain the high level of stakeholder involvement in the INSPIRE process
- Capacity building issues

Regarding the timetable for the implementation of the provisions of the INSPIRE Directive, the process is now entering a new phase, as the emphasis shifts from the EC to the MS (Masser 2012) which will be certainly very challenging.

4 Conclusion

Eleven years after INSPIRE was conceived and 5 years after its formal adoption, we can see clear results and benefits. Every day, more and more spatial data within the framework of INSPIRE become available throughout the EU e.g. Geodata Services for European soil data (Feiden et al. 2011). They may not yet be harmonised, because that process is just beginning, but data are already available for discovering and viewing. By the end of 2012, users should also have real access to spatial data through download services, which will be another important step towards providing European SDI. Another great achievement has been collaboration. The INSPIRE process has involved hundreds of experts and professionals from all over Europe. The complexity of this participatory approach is certainly innovative, not only in relation to the development of SDIs, but also more generally to the formulation of public policy at the European level.

The main stakeholders have been also already “inspired” in each country as well as at the European level, which has triggered many other initiatives. Awareness has been raised across the public sector and individuals and organisations encouraged to think about their roles and the datasets for which they are responsible.

All eyes are now clearly focused on the MS. Their experiences in implementing INSPIRE in the coming period will be crucial to the planning and preparatory activities already started for the review of the INSPIRE Directive, which is due in 2014.

The efficient implementation of INSPIRE also involves cost benefit considerations which are a core part of the process. It is important to raise awareness, especially among users, of the need to monitor the benefits, which will not be obvious immediately, but only when they

budućem razdoblju bit će ključna u planiranju i pripremi već započelih aktivnosti vezanih uz reviziju INSPIRE direktive koja je predviđena za 2014. godinu.

Za učinkovitu implementaciju INSPIRE-a potrebne su i analize troškova i koristi koje su važan sastavni dio procesa. Važno je podići svijest o praćenju koristi prije svega na strani korisnika jer se one mogu početi sagledavati tek kada se INSPIRE podaci budu koristili u svakodnevnim poslovnim procesima. Može se očekivati kako će se koristiti interoperabilnih podataka iz Priloga I jasno vidjeti tek kada krene šira upotreba tematskih podataka iz Priloga II i III kojima su podaci iz Priloga I referentni. Financijska kriza koja je još uvijek prisutna dodatan je izazov za INSPIRE jer potiče veću suradnju što može ubrzati i optimirati cijeli INSPIRE proces.

Uloga JRC-a u INSPIRE procesu u skladu je s njegovom misijom pružanja znanstvene i tehničke podrške u osmišljavanju, razvoju, implementaciji i praćenju politika EU-a. Od početka kreiranja INSPIRE inicijative pa do danas uloga JRC-a je bez ikakve sumnje nezamjenjiva. Ta je uloga od uglavnom tehničke evaluirala u sveobuhvatnu podršku uspostavi INSPIRE-a i sigurno je da će se kao takva nastaviti i u budućnosti.

Iz perspektive JRC-a budućnost INSPIRE-a, zajedno s ostalim sličnim inicijativama kao npr. GEOSS i dr., može se sagledati kao osnova za novu generaciju digitalne Zemlje (Annoni i dr. 2011; Craglia i dr. 2012).

5. Rječnik pojmova

INSPIRE

Infrastruktura za prostorne informacije u Europskoj uniji

INSPIRE komponente

vidi INSPIRE provedbena pravila

INSPIRE arhitektura

Modeli, norme, standardi, tehnologije, specifikacije i procedure koje se koriste za prikaz, transformaciju, prilagodbu, integraciju, održavanje i korištenje informacija u digitalnom formatu radi uspostave INSPIRE-a.

INSPIRE direktiva

Direktiva 2007/2/EC Europskog parlamenta i Vijeća od 14. ožujka 2007. o uspostavi Infrastrukture za prostorne informacije u Europskoj uniji (INSPIRE). Direktiva je objavljena u službenom glasilu 25. travnja 2007. a stupila na snagu 15. svibnja 2007.

INSPIRE forum

Web-stranica za razmjenu informacija o INSPIRE-u i povezanim inicijativama.

INSPIRE geoportal

INSPIRE geoportal omogućava pretraživanje skupova prostornih podataka i usluga te, ovisno o pravima pristupa, omogućuje pregled skupova prostornih podataka zemalja članica obuhvaćenih INSPIRE direktivom.

INSPIRE implementacija

vidi INSPIRE proces

INSPIRE provedbena pravila

Kako bi se osigurala kompatibilnost i iskoristivost infrastrukture prostornih podataka zemalja članica, INSPIRE direktiva zahtijeva prihvaćanje zajedničkih provedbenih pravila u različitim područjima koji čine osnovne komponente INSPIRE-a. To su: metapodaci, podatkovne specifikacije, mrežne usluge, dijeljenje podataka i usluga te praćenje i izvješćivanje.

INSPIRE inicijativa

Razvoj INSPIRE-a pokrenut je kao inicijativa u svrhu uspostave infrastrukture za prostorne informacije u Europi koja će pomoći da se prostorne informacije učine dostupnima i interoperabilnima širem krugu za potrebe podrške održivom razvoju.

INSPIRE legislativa

vidi INSPIRE direktiva i INSPIRE provedbena pravila

INSPIRE proces

Skup mjera i aktivnosti koje moraju poduzeti zemlje članice kako bi ostvarile sukladnost s INSPIRE-om.

INSPIRE teme prostornih podataka

INSPIRE direktiva obuhvaća 34 teme prostornih podataka potrebnih za aplikacije u okolišu. Teme su podijeljene u tri priloga direktive.

INSPIRE web-stranica

Web-stranica koju održava Europska komisija radi poboljšanja javnog pristupa informacijama o INSPIRE-u.

Transpozicija INSPIRE direktive

Transpozicija podrazumijeva prijenos INSPIRE direktive u nacionalno zakonodavstvo u obliku zakonskog propisa.

start to use INSPIRE conformant data in their daily business. It is expected that the benefits of interoperable Annex I data will become fully apparent once similar arrangements are put in place for Annex II and III, where referencing thematic information to the data of Annex I is expected to be widely used. In the recent financial crisis, INSPIRE has proved a challenge, as collaboration has intensified, and this may accelerate and optimise the whole INSPIRE process.

The role of the JRC in the INSPIRE process is in line with its mission to provide customer-driven scientific and technical support for the conception, development, implementation and monitoring of EU policies. Since the beginning of the INSPIRE initiative until now, the role of the JRC has been indispensable beyond doubt. Its role has evolved from a technical to a much broader one, and it will certainly continue in this direction in the future.

From the JRC point of view, the future of INSPIRE, together with other similar initiatives e.g. GEOSS and many others, can be seen as an essential part of next generation Digital Earth (Annoni et al. 2011; Craglia et al. 2012).

5 Glossary

INSPIRE

Infrastructure for Spatial Information in the European Community

INSPIRE components

See INSPIRE implementing rules

INSPIRE architecture

The models, standards, technologies, specifications and procedures used to represent, transform and generally accommodate the integration, maintenance and use of information in digital format in order to realize the INSPIRE.

INSPIRE Directive

Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE) was published in the Official Journal on 25 April 2007. The INSPIRE Directive entered into force on 15 May 2007.

INSPIRE Directive transposition

Transposition of the INSPIRE Directive into the national legislation of member states.

INSPIRE forum

A Web 2.0 site for the exchange of information on INSPIRE and related initiatives.

INSPIRE geoportal

The INSPIRE geoportal provides the means to search for spatial data sets and spatial data services and, subject to access restrictions, to view spatial data sets from EU member states within the framework of the INSPIRE Directive.

INSPIRE implementation

See INSPIRE process

INSPIRE implementing rules

To ensure that the spatial data infrastructures of the member states are compatible and usable in a community and transboundary context, the Directive requires that common implementing rules (IRs) are adopted in a number of specific areas which are the main INSPIRE components: metadata, data specifications, network services, data and service sharing and monitoring and reporting.

INSPIRE initiative

The development of INSPIRE started as an EU initiative to establish an infrastructure for spatial information in Europe to help to make spatial or geographical information more accessible and interoperable for a wide range of purposes supporting sustainable development.

INSPIRE legislation

See INSPIRE Directive and INSPIRE implementing rules

INSPIRE process

A set of activities and measures which member states will undertake to meet INSPIRE compliance.

INSPIRE spatial data themes

The INSPIRE Directive addresses 34 spatial data themes needed for environmental applications. These themes are subdivided in the three Annexes of the Directive.

INSPIRE web page

Web page maintained by the European Commission to enhance public access to information about INSPIRE

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