



INSPIRE
Infrastructure for Spatial Information in Europe
Consolidation Team

Terms of Reference
for developing Implementing Rules laying down technical
arrangements for interoperability and harmonisation of spatial
datasets

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Abbreviations

CEN	European Committee for Standardization
CT	Consolidation Team
DG	Directorate General
DS	Data Specifications
DSS	Data and service sharing
DT	Drafting Team
EC	European Commission
EEA	European Environment Agency
Eionet	European Environment Information and Observation Network
EU	European Union
FP6/7	Sixth/seventh framework programme for research
GCM	Generic Conceptual Model
GMES	Global Monitoring for Environment and Security
INSPIRE	Infrastructure for Spatial Information in Europe
IR	Implementing Rule
ISO	International Organisation for Standardization
IT	Information Technology
JRC	Joint Research Centre
LMO	Legally Mandated Organisations
MD	Metadata
MR	Monitoring and Reporting
MS	Member State
NS	Network Services
SDI	Spatial Data Infrastructure
SDIC	Spatial Data Interest Community
TC	Technical Committee
TOR	Terms of Reference
TWG	Thematic Working Group
WP	Work Programme

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Purpose of this document

This document complements the INSPIRE work programme for the transposition Phase (2007-2009) by defining the terms of reference (TOR) of the actors involved in the development of the Implementing Rules (IR) laying down technical arrangements and, where applicable, harmonisation of spatial datasets and services (Art. 7 of Directive 2007/2/EC).

These TOR address only on the development of the harmonised data specifications and not the specifications for services. The recent document does not replace the TOR published in the Work Programme for the Preparatory Phase (2004-2006) but completes it with the description of new roles and the new actors.

These TOR are valid for data specification development of Annex I, II, and III spatial data themes. However, a detailed roadmap for Annex II and III has not been established yet; it will be the subject of the work programme for 2009-2012, although work on some Annex II and III spatial data themes may start earlier should stakeholders wish so. The deadlines in this document, if otherwise not stated, refer those related to data specification of Annex I themes.

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1 Introduction

“The Directive of the European Parliament and of the Council establishing an infrastructure for spatial information in the Community (INSPIRE)” has been formally approved by the Council of Europe and by the European Parliament on 29 January and 12 February 2007, respectively.

The INSPIRE Directive 2007/2/EC was published in the Official Journal the 25th of April 2007¹, and entered into force on 15th of May, 2007.

Being a framework directive, INSPIRE defines the objectives to be achieved, while Member States define the way in which they will achieve these agreed objectives through the transposition of the Directive into national legislation. To provide coherence to the infrastructure, the Directive envisages the development of a series of Implementing Rules (IRs) to be approved by the INSPIRE Committee. Details of the IRs required and their timetable are included in the INSPIRE Roadmap (Section 2.6 of the INSPIRE Work programme for the Transposition Phase 2007-2009²).

This document refers to the development of IRs laying down technical arrangements for interoperability and, when practicable, harmonisation of spatial datasets. The process is divided in two phases.

- Development of conceptual framework and specification methodology. This work started in the preparatory phase and will be concluded early in the transposition phase.
- Development of data specifications for the 34 themes listed in Annex I, II, and III of the Directive. This work will be carried out based on the conceptual framework and specification methodology, based on the INSPIRE roadmap.

The data specification developed in the second step will become part of the IRs. The deliverables of the first step are useful in order to establish the data specifications, but will not be part of any IR.

The IRs for data specifications need to be adopted within two years after entry into force of the INSPIRE Directive for data sets corresponding to the data themes in the Annex I and within 5 years for those covered in Annex II and III (Article 9).

An IR adopted for interoperability and where practical for harmonisation of spatial data sets shall address the following harmonisation elements (Article 8):

- for Annex I, II, III (spatial data themes):
 - definition and classification of spatial objects,
 - geo-referencing;
- and for Annex I, II (spatial data themes):
 - common system of unique identifiers for spatial objects;
 - relationship between spatial objects;
 - key attributes and corresponding multilingual thesauri;
 - how to exchange the temporal dimension of the data;
 - how to exchange updates of the data.

Specifications for Annex III themes can go beyond the objectives of Article 7(4) of the INSPIRE Directive if the identified user needs require doing so and the potential data providers are supporting the initiative.

Other important issues related to the INSPIRE data specifications are (Article 10):

- 3rd parties shall have access to these specifications at conditions not restricting their use;
- Cross-border issues shall be agreed on.

The INSPIRE Work Programme for the Transposition Phase has defined the basic principles and organisational framework for a participative and transparent IR development process in

¹ <http://eur-lex.europa.eu/JOHtml.do?uri=OJ:L:2007:108:SOM:EN:HTML>

² http://www.ec-gis.org/inspire/reports/transposition/INSPIRE_IR_WP2007_2009_en.pdf

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field of data specifications. These specific measures are necessary to cope with the complexity of the specification development process and to address the broad field of knowledge required for specifying the 34 data themes listed in the annexes of the Directive.

The specification development will follow seven principles:

- I. Specify each data theme in only one designated IR; an IR may contain one or more data specifications;
- II. Ensure conformance to the INSPIRE General Conceptual Model (GCM) and overall consistency in specification development process by applying the common, agreed INSPIRE methodology;
- III. Involve the necessary domain expertise for each INSPIRE spatial data theme;
- IV. Analyse and take into account, when appropriate, the reference materials provided by the Spatial Data Interest Communities (SDICs), Legally Mandated Organisation (LMOs) and the Consolidation Team (CT);
- V. Document how user requirements, existing international initiatives and standards, feasibility, and cost-benefit considerations have been taken into account in the development of the IRs.
- VI. Utilise wherever possible existing organisational structures (e.g. European thematic networks like Eionet);
- VII. Guarantee a transparent and open process through consultations with relevant stakeholders.

Based on these principles the organisational structure shown in Fig. 1 has been proposed. The core concept of this structure is the use of 3 development scenarios depending on the amount of the work to be done to achieve the interoperability of datasets and services defined in Chapter III of the Directive.

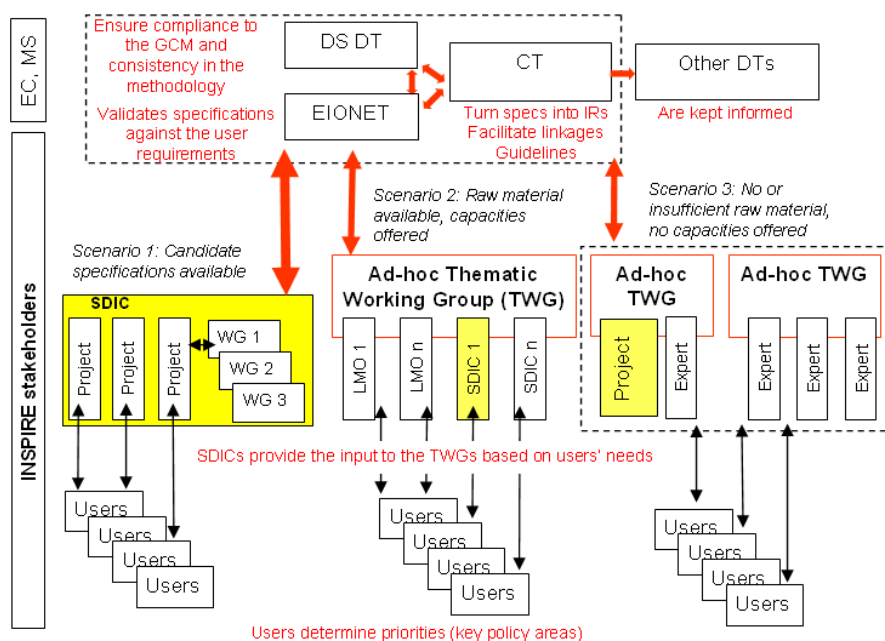


Figure 1 – Organisational structures of the 3 specification development scenario

Scenario 1 applies when a community has already agreed INSPIRE compliant data specifications³ that have found widespread use. This community, involved in INSPIRE as a SDIC or LMO, may propose these specifications as candidate draft INSPIRE IRs. After a procedure that involves checking the proposed specifications against the user requirements

³ Under the term “INSPIRE compliant data specifications” it is assumed a compliance to the principles and to the thematic extent of the themes from Annex I, II and III of the INSPIRE directive (2007/2/EC).

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and conformance with the GCM, the candidate specification will follow the consultation and testing cycle as described in the Work Programme of 2007-2009.

Intellectual Property Rights for all submitted candidate specifications may not be an obstacle for the INSPIRE Implementing Rule becoming publicly available free of charge.

Scenario 2 applies when the proposed contributions and the reference materials are sufficient and appropriate for the given theme, however there is a need to streamline the cooperation within the various SDICs and LMOs, validate the proposed use-cases, and harmonise the specifications. For this purpose a Thematic Working Group (TWG) will be organised, which includes experts from SDICs or LMOs.

In case of **Scenario 3**, the proposed contributions to a spatial data theme are insufficient or completely missing. The IRs for spatial data themes that fall under this scenario will be developed by a TWG, that can either consist of experts selected by the CT, or of a Community-funded project to which the CT may assign additional experts.

Details of the specification development process are given in Chapter 4.2.3 of the Work programme Transposition Phase 2007-2009.

In the subsequent chapters each organisation component will be described in detail, together with their interactions and specific roles.

In addition to the various TOR provided in the following sections, more detailed information will be made available as a part of the Call for Expression of Interest to participate in the data specifications development.

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2 Actors in the data specification development process

The development of the IRs laying down technical arrangements for interoperability and, where practicable, harmonisation of spatial datasets (further referred to as **data specifications**) will take place with wide involvement of the stakeholders associated in groups with distinct roles. Some of these groups, like SDICs, LMOs, Drafting Teams (DTs), and the CT have been introduced by the Work Programme and TOR of the preparatory phase (2004-2006)⁴. Other groups are newly created or involved to meet the specific process and requirements of data specifications. In order to ensure that users are represented during the entire specification process, EEA/Eionet has been invited. Knowledge of domains necessary for specification of the spatial data themes will be bundled in the TWGs. The TWGs are composed of specification development experts.

The **Consolidation Team (CT)** consists of staff of the European Commission (DG Environment, Eurostat and JRC). Its role is to coordinate the IR development. DG Environment acts as the overall legislative and policy co-ordinator for INSPIRE, Eurostat acts as the overall implementation co-ordinator and supports the IR developments on data sharing and monitoring. JRC acts as the overall technical co-ordinator of INSPIRE, and is responsible for the development of IRs for metadata, data specification and network services. JRC guarantees the coherence with relevant standardisation initiatives and ensures the liaison with the European and international research community and their networks and is responsible for the technical coordination with other relevant EU and international initiatives, including the Global Monitoring for Environment and Security (GMES) and the Group on Earth Observation (GEO). JRC is also responsible for the development of the INSPIRE geo-portal.

Spatial Data Interest Communities (SDICs) bundle the human expertise of users, producers and transformers of spatial information, technical competence, financial resources and policies, with an interest to better use these resources for spatial data management and the development and operation of spatial information services. Through their activities they drive the demand for spatial data and spatial information services. Environmental monitoring, reporting and development of applications and services for environmental management are among the main driving forces behind the natural formation of SDICs. SDICs are best placed to know what spatial data is required in implementing different environmental tasks, ranging from local, regional, and national to Pan-European applications. They are expected to participate in the collections of the user requirements that will drive the specification process of the Implementing Rules.

Legally Mandated Organisations (LMOs) are all the Member States' public authorities, institutions and bodies who already got or will get a legal mandate to set up and run one or some of the components of national and regional SDIs, and which are eligible to become the MS' contributors to the ESDI for a particular component. These components cover all fields of activity targeted by INSPIRE and can be either of a technical nature, or of a policy and organisation related nature.

European Environment Information and Observation Network (Eionet)⁵ is a partnership network of the European Environment Agency (EEA) and its member and participating countries. It consists of the EEA itself, a number of European Topic Centres (ETCs) and a network of around 900 experts from 37 countries in over 300 national environment agencies and other bodies dealing with environmental information. The Eionet partnership is crucial to the EEA in supporting the collection and organisation of data and the development and dissemination of information.

Drafting Teams (DTs) are the groups of expert proposed by the SDICs and LMOs and selected by the CT to participate in the process of creation of IRs in the fields of metadata, network services, data sharing and (implementation) monitoring. They were set-up based on

⁴ Available on <http://www.ec-gis.org/inspire/> in the document archive

⁵ <http://www.eea.europa.eu/>

the INSPIRE call published on 9th March 2005, and their composition has since then evolved due to the availability of experts and changes in the requirements of the DTs.

Data Specification Drafting Team (DS DT) is a group of experts proposed by the INSPIRE SDICs and LMOs to participate in the process of creation of IRs laying down technical arrangements for the interoperability and, where practicable, harmonisation of spatial datasets and services. It was set-up based on the INSPIRE call published on 9th March 2005, and its composition has since then evolved based on the availability of experts and changes in the requirements of the DS DT.

A **Thematic Working Group (TWG)** is composed of **specification development experts (SDEX)** responsible for developing technical specifications for the spatial data themes that they are in charge of. Their skills and experiences make it possible to review, take into account, and streamline standardisation and harmonisation initiatives of different international, national, regional and local initiatives in order to achieve interoperability and, where practicable, harmonisation of spatial datasets and services.

The roles and interactions of the actors in the data specification development process are illustrated in Fig.2.

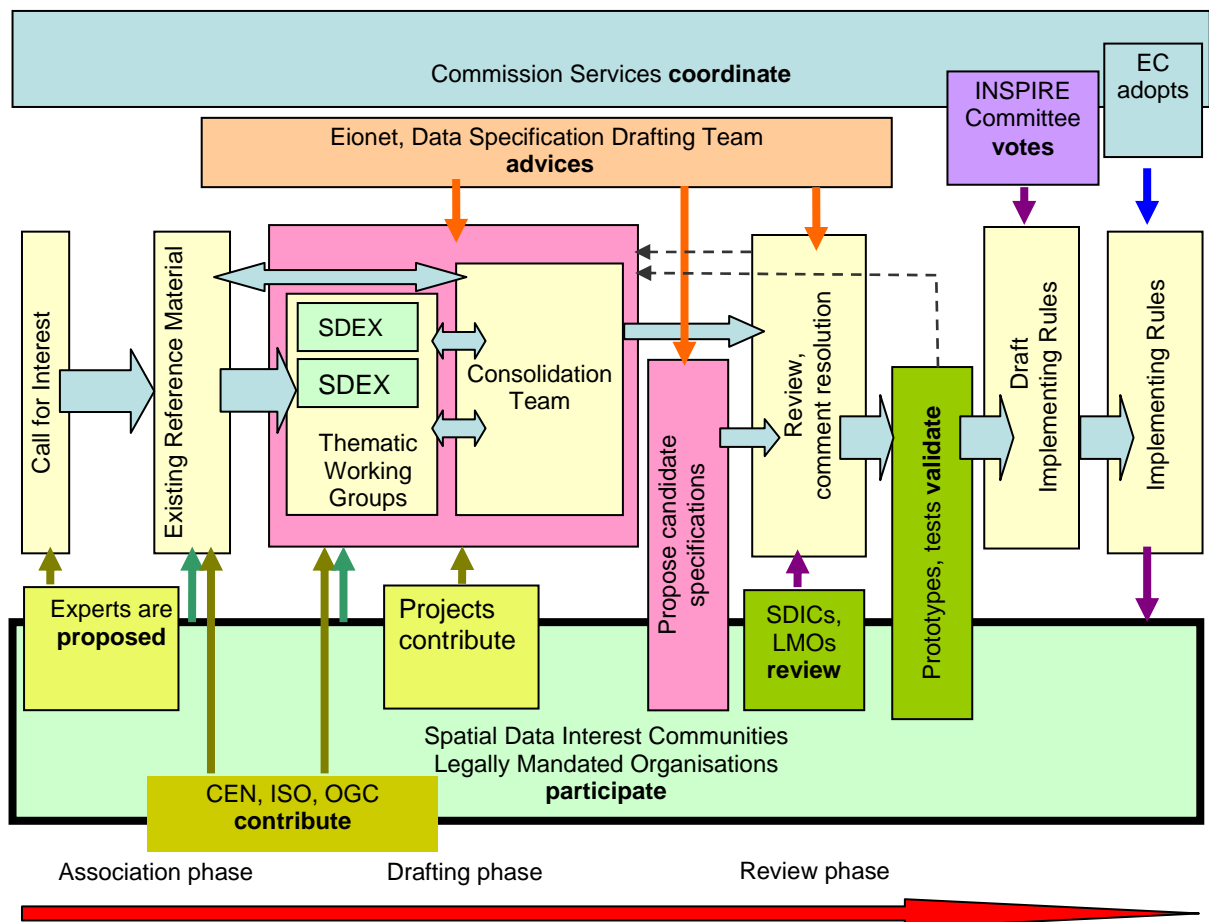


Figure 2 – Actors and roles in the data specification IR development process

The IR development process follows generally the procedure proposed in the Work Programme for the Preparatory Phase. However, due to the highly technical character of data specifications the public consultation will be skipped. Interested stakeholders can associate to INSPIRE as SDICs or LMOs at any time as the registration will be open during the entire data specification process. Stakeholders are encouraged to join an already existing SDIC.

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In order to properly address the comments received from the SDICs and LMOs in the review phase, **comment resolution workshops** are foreseen. The objective of these workshops is to discuss diverging proposals between the SDICs, LMOs, and the TWG. In addition to the TWG members the representatives of the SDIC/LMO and other experts can be invited in order to elaborate a common position.

The role, mandate, and terms of reference of each actor are detailed in sequence from generic to more specific.

2.1 Consolidation Team

2.1.1 Background

The CT is in charge for coordinating the IR development including the data specification process. The development of the IRs for data specifications is the responsibility of JRC. DG Environment, assisted by European Environment Agency will ensure the co-ordination with the needs of environmental policies, channelling the users' need in the specification process. The CT as a whole is responsible for strategic decisions and streamlining the activities related to the different components of the infrastructure.

2.1.2 Mandate

The interaction between the Commission Services, DTs and TWGs continues to be organised by the CT.

The data specification development should be user driven. The CT will provide the organisational framework for the collection of the user requirements and will maintain the list of international organisations under Article 7 of the Directive. Considering the proposal of the DS DT the CT will decide about grouping/linking themes together for specification development.

In the context of IR development for harmonised data the CT will decide which development scenario applies to a given spatial data theme, based on the results of an open call. The CT will seek the advice of the DS DT and Eionet to decide if candidate specifications proposed by a SDIC can be regarded as first draft for IR according to scenario 1.

The CT determines the composition of the TWG, selecting its members out of the experts proposed by the SDICs/LMOs (scenario 2) or individual experts (scenario 3). Whenever necessary the CT will consult any of the DTs or invite additional experts to solve specific technical questions or cross DT issues. As proposed by the TWG or the DS DT the CT may convene technical workshops to support the specification process.

The first draft of IR will be reviewed in the first place by DS DT, Eionet, and the CT. The CT will keep informed all the DTs through their CT contact points about the main developments. The CT will ensure coherence among IRs by consulting relevant expertise when needed and decide whether the IRs or their drafts already in place need maintenance.

The CT will organise the review within the SDICs and LMOs, including an eventual comment resolution workshop. Based on the proposal of the TWG in charge the CT will prepare the final draft of technical provisions and ensures its timely delivery to the services that are in charge for the legal process.

The CT will consider the requirements expressed by the DTs for different types of registers and identifies ways in which these can be published and maintained.

The Commission services will provide the appropriate communication channels (intranet, phone conference facilities) to the teams involved in the specification process. In order to keep the data specification process traceable and easy to follow the CT will maintain a specific calendar on the INSPIRE website.

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2.1.3 Timeframe

The CT remains in place until the Commission decides to dissolve the CT.

2.1.4 Terms of Reference⁶

The tasks and the role of the CT can be summarised as follows:

- to take strategic decisions connected to the IR development process
- to decide which specification scenario applies for a given theme,
- *to select and, if required, replace the experts for the TWGs*
- *to activate any DT to resolve specific cross DT issue raised by a TWG or DS DT,*
- *to invite additional expert to check cross theme consistency,*
- *to decide about theme grouping in IR development,*
- *to coordinate the collection of user requirements,*
- to maintain a list of organisations under international law according to Art.7,
- to organise technical workshop to support the specification process,
- to keep informed all the DTs about the main developments of the specifications,
- to organise the review within the SDICs and LMOs,
- *to convene comment resolution workshops, if necessary, following the consultation with SDICs and LMOs,*
- to consolidate the results of the review,
- to provide communication and meeting facilities,
- *to identify ways in which registers can be published and maintained,*
- *to forward the final draft to the legal procedure,*
- *to maintain the data specification calendar on the INSPIRE web-site,*
- *to identify any Community-funded projects that can develop data specifications for spatial data themes for which no candidate specifications are available;*
- *to liaise with other DGs of the Commission in order to ensure coherence between INSPIRE-related activities,*
- *to mobilise resources.*

2.2 The Spatial Data Interest Communities and Legally Mandated Organisations

2.2.1 Background

The IRs may have an impact on the way the stakeholder communities will manage their spatial data and associated services. Their support and participation in the design, review, and testing of the IRs results in mutual benefits for INSPIRE and their communities.

SDICs and LMOs are recognised as INSPIRE stakeholders once they have registered through the INSPIRE website.

2.2.2 Mandate

SDICs and LMOs are present in the entire data specification development process. One of their important roles is to provide reference materials for data specifications, both from user requirement and data provider parts.

Descriptions of user scenarios are valuable input for data specification development and will be used as reference materials. User requirements have to be understood as in line with environmental policy needs, and those policies that have an environmental impact. A typical INSPIRE use case address pan-European or cross border scenarios and may deal with multilingualism. The other important sources of reference material are the data providers and transformers that may submit their data product specifications or solutions for data integration.

⁶ The new elements of the ToR as compared to the Work Programme for the Preparatory Phase are printed in *italics*.

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In the Preparatory Phase the INSPIRE stakeholders submitted more than 150 items relevant for data specifications. However, they are not evenly distributed amongst the spatial data themes, and the submitted materials are far from complete. SDICs and LMOs are invited therefore to submit additional materials for reference according to the roadmap of IR development given in section 5 of the INSPIRE Work Programme Transposition Phase 2007-2009.

INSPIRE focuses on providing access to existing data through harmonised specifications. The harmonisation requirements are described in the GCM⁷, which has been developed taking into account the existing initiatives of Member States, international and standardisation organisations. This principle will apply also in the data specification development phase, when the SDICs and LMOs have the possibility to put forward candidate specifications for INSPIRE under the conditions described in scenario 1, or propose resources for the specification development under scenario 2. **However it should be recognized that a single organisation normally cannot claim to be the single source for INSPIRE Implementing Rules.** It is expected that candidate specification will emerge from international networks of stakeholders. Even widely accepted and used specifications shall be verified against the user requirements and conformance to the GCM.

When no relevant candidate specifications are identified SDICs/LMOs are eligible to propose their capacities to work in one or several TWGs that are in charge for drafting IRs for a given theme as put forward in scenario 2 and 3. They can propose experts or testing capacities.

SDICs and LMOs continue to participate in the review process of draft IRs in a dedicated period. They have the possibility to compare draft IRs with their needs and current practices; they can carry out partial and full tests. Their observations have to be evaluated by the TWG responsible for the development of the given IR. In case of serious divergence between the proposed technical solutions or substantial comments on the impact of the specifications the representatives of the SDIC will be invited to the comment resolution workshop to put forward their position and find a common solution.

Given their specific position in the implementation of the Directive, relevant LMOs have a distinct role in testing the technical aspects together with analysing their likely impact.

SDICs through their networks can participate in awareness raising and in identifying training needs necessary for the implementation of INSPIRE.

The formal requirements for involvement in INSPIRE starts with the registration. The registration for SDICs and LMOs remains open during the entire IR development period, to provide the possibility for inclusion of those stakeholders that wish to join when a theme in their interest is being developed.

2.2.3 Timeframe of work

As laid down in the INSPIRE Work Programme, specification tasks are linked to dedicated deadlines. Each supporting activity therefore must be accorded to guarantee the timely delivery of inputs. For example reference materials should arrive before the specification of the related theme starts. Likewise candidate specification and capacity offers for scenario 2 have to arrive in such time that allows the CT to take decisions. For Annex I the deadline of submitting further reference materials, candidate specifications and proposing capacities for IR development is 30 September 2007.

The specification development process for Annex I themes lasts from November 2007 till August 2008, which will be followed by the internal review. In this period SDICs/LMOs are expected to support the work of their experts if they have been selected for a member of a TWG.

⁷ http://www.ec-gis.org/inspire/reports/ImplementingRules/inspireDdataspecD2_5v2.0.pdf

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The consultation with the SDICs and LMOs for Annex I theme starts in the second half of November 2008 and lasts till the second half of January 2009. SDICs and LMOs are invited to run tests or prototypes based in this draft and deliver the results by the end of January 2009.

2.2.4 Terms of reference

The different roles of the SDICs and LMOs in the drafting, reviewing and testing of the IRs for harmonised data specifications are the following:

- to identify and describe user requirements,
- to provide reference material,
- to participate in testing the technical specifications
- to participate in the review process of the draft Implementing Rules,
- to develop, operate and evaluate implementation pilot,
- to provide cost-benefit aspects of implementation,
- to develop initiatives for guidance, awareness raising and training in relation with the INSPIRE implementation,
- *to propose candidate specifications for INSPIRE,*
- *to propose experts for one or several TWGs responsible for IR development,*
- *to participate in the comment resolution workshops convened by the Commission.*

2.3 EEA Eionet

2.3.1 Background

Based on Article 1 of the Directive, INSPIRE should be established for purposes of Community environmental policies or policies and activities that may have an impact on environment. Therefore it should meet the requirements of environmental applications expressed through different user requirements and use-cases. Recital 29 of the Directive underlines the importance of the EEA and EIONET contributing actively to INSPIRE since they ensure the flow of policy-relevant environmental information between Member States and the Community institutions. As such they represent a fundamental user community.

2.3.2 Mandate

The specification process should start and end at the users: their requirements have to be collected and considered. Likewise the draft specifications should be verified against these requirements. The Eionet has set up networks for information flow between representative users. Thus its participation is crucial in developing the IRs.

When candidate specifications are submitted by a SDIC or LMO the CT will be advised by the Eionet about the fitness for purpose of the proposal from users' point of view.

When data specifications are developed according to scenario 2 and 3 the TWG should consider the user requirements and evaluate them. The Eionet is supposed to advise the TWGs in highlighting to most relevant application scenarios for INSPIRE. When version 1.0 of the specifications is ready, Eionet will participate in the internal review. The TWGs have to consider the proposals of Eionet; in case of discrepancies between the specifications and the user requirements the specification process, based on the recommendation of the Eionet and the decision of the CT, may be reiterated using the use-cases recommended by Eionet experts.

Eionet and their members will equally participate in the review within the SDICs and LMOs. In the testing phase Eionet is expected to propose user scenarios requiring data integration from different Member States across different spatial data themes.

The experts participating in the validation process against the user requirements are jointly nominated by the Eionet and EEA.

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2.3.3 Timeframe of work

The generic timeframe of work is in line with the roadmap given in the Work Programme 2007-2009. However for Annex I data already 4 peaks of activities can be identified:

- October 2007: In case of eventual submission under scenario I the specification have to be validated against the recognised user requirements;
- December 2007 – January 2008: validation of requirements lists proposed by the DT;
- June 2008: Proposal application scenario for testing Annex I specifications;
- September 2008: Internal review of draft specifications (version 1.0) for Annex I.

2.3.4 Terms of reference

People involved in Eionet are eligible to answer the new calls for expression of interest for the members of the TWGs. However, those experts that are eventually selected to become a member of a TWG will not participate in the tasks listed bellow in order to avoid a possible conflict of interest.

The different roles of the Eionet in the drafting, reviewing and testing of the Implementing Rules can therefore be summarized as follows:

- *Validate candidate specifications submitted under scenario 1,*
- *Review and validate the initial requirement list drawn up by the TWGs,*
- *Propose use-cases for specification development and testing,*
- *Participate in the internal review,*
- *Participate at the comment resolution workshops,*
- *Participate in the review within the stakeholders.*

2.4 Drafting Teams

2.4.1 Background

DTs are responsible for drafting IRs related to different components of the infrastructure: metadata, data, network services, and data sharing, as well as those related to implementation monitoring. Due to the specific tasks that the DS DT plays in the data specification process its roles and TOR will be described separately in chapter 2.5.

2.4.2 Mandate

SDI components cannot be developed in isolation. Their interrelation should be kept in mind in order to take measures when coherence and technical solutions require so.

Many of the data specification elements of ISO 19131:2007 will serve as metadata. In addition, evaluation metadata for the themes can be specified by the TWG. The TWGs naturally will take into account the provisions of the metadata IR (or its draft). Similarly the draft IRs of data specification need to be checked from the metadata point of view.

The data specification and network services are also interlinked. Data encoding depend on the download services, WFS or WCS should be defined in accordance of the data to be transmitted. If there is a need for specifying portrayal, this can be done in collaboration of NS DT, DS DT and the TWGs.

In many Member States rights for use of spatial data depends on the technical characteristics. Therefore the final specifications of the themes may have an effect on the IRs on data sharing.

The question what to monitor (e.g. which datasets) can be decided based on the final specification of the spatial data themes. This is a valuable input both for the MR DT and the Member States. The concrete technical solutions may influence the methods of indicator generation for monitoring.

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Naturally these are only examples; in the process of the work many other aspects may occur. Therefore all the DTs must be kept informed about the developments of the data specifications. The CT may ask any of the DTs to take actions when a concrete technical or procedural problem requires doing so.

The DTs will be notified about the drafts delivered by the TWGs. The DTs are expected to check how much data specifications are in line with their technical or legal provisions. In case of discrepancies the CT will take appropriate measures.

2.4.3 Timeframe

Because of the interrelations it is highly desirable that interactions between data specifications and metadata, network services, data sharing and monitoring take place during the entire data specification process. However the timeframes of various DTs differs from that of data specifications. If a DT is still in the place the CT will consult it whenever a cross component issue comes up. In other cases the CT will find an appropriate structure to achieve the resolution of the problem.

In case of Annex I the Internal review of draft specifications (version 1.0) is foreseen in September 2008, where all the DTs in place are expected to contribute.

2.4.4 Terms of Reference

The different roles of the DTs other than Data Specification in the drafting, reviewing and testing of the Implementing Rules can therefore be summarized as follows

- Advise the TWGs on technical and procedural questions on the request of the CT
- *Check whether the application specification generate a need for amending the drafts, or the IR already in place.*

Regardless of their membership the experts of the DT are eligible for membership in the TWGs. Such TWG members do not exercise their rights stemming the DT membership when the drafts of that TWG are discussed.

Regardless of their membership the experts of the DT are also eligible to represent their SDIC/LMO at the comment resolution workshops

2.5 Data Specification Drafting Team

2.5.1 Background

The main task of the DS DT in the preparatory phase was to elaborate the GCM, to propose a repeatable methodology for specification development, to define a starting point for each theme in terms of use examples, recognised requirements, initiatives already in place and overlaps / internal relationships between the themes and to provide guidelines on data encoding.

The findings and the rules to be applied in developing the IR are summarised in the following base documents:

- D 2.3 Definition and scoping of the Annex themes⁸
- D 2.5 Generic Conceptual Model⁹
- D 2.6 Methodology for the development of data specifications¹⁰
- D 2.7 Guidelines for the encoding of spatial data¹¹

These documents are the prime reference materials for developing the theme specifications; their provisions shall be rigorously followed in order to achieve overall consistency in the

⁸ http://www.ec-gis.org/inspire/reports/ImplementingRules/inspireDdataspecD2_3v2.0.pdf

⁹ http://www.ec-gis.org/inspire/reports/ImplementingRules/inspireDdataspecD2_5v2.0.pdf

¹⁰ To be published in August 2007

¹¹ to be published in October 2007

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process. The data specification process of the themes however may yield results that have generic effect. In this case the DS DT has the responsibility to update the respective base document.

2.5.2 Mandate

The field of activities of the DS DT in the data specification phase is twofold. On one hand the DT continues being in charge for the conceptual framework, which enables to keep coherent the specification development of the 34 spatial data themes of the Directive. They update the GCM if a generic concept is resulted from the data specifications. On the other hand the DT serves as an advisory group providing guidance to the TWGs and advising the CT in decisions concerning the coherence of the specification process and conformance to the GCM.

The members of the DT have the best knowledge to advise the TWGs and the CT concerning the conformance to the GCM and the coherence of the specification process. Consequently DS DT will remain in place throughout the specification process; they will participate in the review of candidate specifications submitted according to scenario 1 and the drafts delivered by the TWGs according to scenarios 1 and 2.

The DT may propose to the CT to group several themes together if overall consistency requires so, or the grouping may lead to economies in the resources involved. The DT may recommend to the CT to involve additional expertise to ensure consistency between the spatial data themes.

DS DT participates in the first review cycle together with the CT and Eionet, before the draft is sent to the SDICs and LMOs. The observations of the DT must be carefully analysed by the TWG. The representative(s) of the DT will be also invited to the eventual comment resolution workshop aimed at resolving problems after the review by the SDICs and LMOs.

2.5.3 Timeframe of work

The DS DT remains in place throughout the data specification process, until May 2012. In connection of data specification development of Annex I two peak working period can be already identified:

- October of 2007: In case of eventual submission under scenario 1 the specifications have to be checked for conformance to the GCM;
- September 2008: Internal review of draft specifications (version 1.0) for Annex I.

2.5.4 Terms of Reference

The different roles of the Data Specification DT in the drafting, reviewing and testing of the Implementing Rules can therefore be summarised as follows.

- *to propose grouping of themes for bundled /simultaneous Implementing Rules development,*
- *to advise the TWGs and the CT on issues of conformance to the INSPIRE Generic Conceptual Model,*
- *to advise the TWGs and the CT on issues of overall coherence of the specification process,*
- *to advise the CT on issues of consistency between the themes*
- *to update the INSPIRE conceptual framework documents if the need is identified*
- *to participate in the internal review of the draft Implementing Rules for Data Specifications*
- *to participate at the comment resolution workshop upon the review within the SDICs/LMOs.*

Regardless of their membership the experts of the DT are eligible for membership in the TWGs. Such TWG members do not exercise their rights stemming the DT membership when the drafts of that TWG are discussed.

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Regardless of their membership the experts of the DT are also eligible to represent their SDIC/LMO at the comment resolution workshops.

2.6 Thematic Working Groups

2.6.1 Background

The TWG consist of one facilitator, one editor and a number of domain experts. The domain experts will be proposed by the SDICs and LMOs and selected by the CT when scenario 2 applies. In case of scenario 3 there are two possibilities. The first one is that the CT identifies one or more Community-funded projects the experts of which will constitute a TWG, and the second possibility is that the CT will select the experts from the list drawn up following an open call of expression of interest¹². In both scenarios (2 and 3), the facilitator and the editor are nominated by the CT.

2.6.2 Mandate

In case when no candidate specifications are proposed according to scenario 1, Implementing Rules will be drafted by the TWGs. Each theme listed in the annexes of the Directive is designated by the CT to only one TWG. One TWG can be in charge for developing technical specifications for one or several themes.

The TWG will analyse the submitted use-cases. The validated use-cases will be used then for the specification development and defining the corresponding data requirements. In the validation process the TWG will consider the opinion of the experts of the Eionet.

Besides of the user requirements existing data harmonisation and standardisation initiatives must be analysed in order to avoid duplications. Careful considering of the reference materials submitted by the stakeholders will provide input to the "as is" and "gap" analysis in the specification process. The process of developing INSPIRE data specifications is described in more details in D 2.6 Methodology for the development of data specifications.

The technical provisions of the Implementing Rules will be prepared according to ISO 19131:2007 (Data product specifications) and the development process will be governed by the INSPIRE conceptual framework detailed in chapter 2.5.1.

Whenever possible, the TWG will use the terminology, spatial object types, and other items already present in the INSPIRE registers. When new spatial object types, attributes, code lists or other elements need to be specified the TWG will seek advice of the DS DT and provide the appropriate new entries to the CT.

The TWG can request the CT to appoint additional expertise both for consistency checking from point of view of other INSPIRE spatial data themes and also for resolving specific technical problems. The CT decides about the necessary measures ranging from employment of additional experts from other domains to organising a technical workshop. The latter will be used mainly for solving cross-thematic issues of major importance.

The specification process shall be carefully documented and referenced; in case of competing solutions consideration should be given to technical and organisational aspects, and likely impacts. As an accompanying material this document will be published together with the draft IR to make the process transparent to the stakeholders.

In order to make results and benefits of INSPIRE visible for political decision makers and the broad public the TWGs are supposed to propose an easy-to-understand use example with a graphical illustration to the CT.

¹² To be published in September 2007

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The proposed draft IR (version 1.0) will be reviewed in first place by the DS DT, the CT, and the Eionet. The main objectives of this review is

- to clarify how the user requirements are met,
- to check conformance to the INSPIRE conceptual framework, especially conformance to the GCM
- to verify overall consistency,
- and to provide feedback whether IRs already in place or the base data specification documents need maintenance.

The TWG is expected to carefully analyse the comments and complete/modify the draft when the proposed measures are supported by the parties. In order to resolve diverging proposals the CT will provide facilities for further discussion. The final decision will be taken by the CT. The results of the review are summarised in version 2.0 of the draft, which will be made available for the SDICs and LMOs for review and testing.

The comments received from the SDICs will be analysed by the TWG. Each comment and proposal shall be considered; in case of rejection the decision has to be reasoned. In case of serious divergence between the proposed technical solutions or substantial comments on their likely impacts, the TWG informs the CT, which provides further discussion forums, including a comment resolution workshop. The representative of the SDIC/LMO concerned is invited to this workshop to explain their position and find the common resolution.

2.6.3 Timeframe of work

The TWGs are expected to follow the timeframes set in the roadmap in the Work Programme for the transposition phase. The workload of the members of TWGs is estimated as 60-90 working days over the specification period of Annex I between November 2007 and April 2009.

2.6.4 Terms of reference

The different roles of the TWGs in analysing, drafting and reviewing of the Implementing Rules can therefore be summarised as follows.

- to analyse and take into account, when appropriate, the reference materials and the user requirements submitted by the INSPIRE stakeholders for the specific spatial data theme,
- to analyse and take into account the standards developed by organisations established under the international law (Article 7(1) of the Directive),
- to seek advise of the Eionet at the initial identification of requirements and any time when there is a need to do so.
- to apply the INSPIRE conceptual framework to ensure conformance to the INSPIRE Generic Conceptual Model and overall consistency in specification development process applying the agreed methodology (D2.3, D2.5, D2.6, D2.7)
- to develop technical specifications for the IR(s) they are considering,
- to apply, whenever possible, the terminology, coordinate reference system, the feature catalogue, and other items maintained in the INSPIRE registers
- to propose via the CT newly specified items or changes to existing items to the maintainers of the registers,
- to ensure consistency, when appropriate, by cross-theme checking
- to propose to the CT to assign an expert from other domain or to organise a technical workshop especially in case of cross thematic issues
- to document the specification process with full references and justifications,
- to analyse and consolidate the comments received from the CT and DS DT in the first review cycle
- to analyse and consolidate the results of the review and the testing results from the SDICs and LMO and assist the CT in conflict resolution
- to follow the timeframe of the work programme and the INSPIRE Directive
- to deliver the following documents:
 - Analysis of the reference materials;

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- Analysis of the user requirements and documentation of the use-case development;
- Resolutions of the comments submitted by the stakeholders in frame of reviewing the draft data specifications;
- Data specifications to be included in the draft IR;
- Provide material that can be used for communication purposes..

2.7 Specification development experts

2.7.1 Background

Based on their expertise in SDI architectures, information modelling, standardisation, specification implementation and thematic requirements the TWG members integrate and streamline data specification initiatives according to the identified environmental user requirements. The experts act as domain experts, facilitators or editors.

2.7.2 Mandate

Domain experts are supposed to bring user requirements and/or implementation aspects; to provide expertise about the thematic domain and the data to be used in the application. Domain experts may be invited on case-by case basis to accomplish cross-theme consistency checking when there is a need to do so.

The **facilitator** manages the specification process and ensures that all data harmonisation requirements are identified and adequately addressed and the methodology is followed. The facilitator has to have an in-depth knowledge of the GCM and has to be familiar with the specification methodology. General overview of the domain is also necessary. She/he acts as main contact point for the CT, Eionet and DS DT. The facilitator forwards new concepts for inclusion in the INSPIRE glossary to the CT.

The **editor** is responsible for documenting the data specifications including the application schema according to the template provided in D2.6. She/he will participate in the specification process being responsible for preparation of the document listed in chapter 2.6.4.

2.7.3 Timeframe of work

Please refer chapter 2.6.3.

2.7.4 Terms of reference

The role of domain expert can be summarised as follows:

- *to analyse and take into account, when appropriate, the reference materials, the user requirements, and the standards developed by organisations established under the international law (Article 7(1) of the Directive),*
- *to apply the INSPIRE conceptual framework to ensure conformance to the INSPIRE GCM and overall consistency in specification development process applying the agreed methodology (D2.3, D2.5, D2.6, D2.7)*
- *to develop technical specifications for the IR(s)*
- *to assist the CT in comment resolution.*

The role and tasks of the facilitator are as follows:

- *to guide the specification development process*
- *to act as contact point of the TWG*
- *To ensure that the GCM and the specification methodology are applied and followed*
- *to ensure that the terminology, the feature catalogue, and other items maintained in the INSPIRE code lists are applied*
- *to forward new concepts and other relevant information to the CT for maintenance.*

The tasks and the role of the editor are as follows:

- *to participate in different steps of the specification process,*
- *to prepare the documentation of the data specifications of the theme together with the application schema presented in a conceptual schema language (UML).*

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2.8 The role of Projects, Pilots, and Prototypes

2.8.1 Background

From the point of view of INSPIRE data specifications the projects, pilots and prototypes that target at developing and testing data specifications, harmonising the data component of infrastructures at different levels are of great value. Many ongoing research and development projects, to which various SDICs and LMOs often participate, such as the Framework Programmes for research (FP6, FP7), GMES activities, eContentPlus, and other Community programmes, could provide input and/or facilitate the drafting of the IRs.

2.8.2 Mandate

Projects identified by the CT will be used to develop new specifications for spatial data themes for which Scenarios 1 and 2 are not applicable. Experts from these projects will constitute the TWG and deliver the first draft data specifications (V 1.0) which will be reviewed by SDICs and LMOs. The projects are expected to assist the CT in processing the comments received on V1.0 and participate in the comment resolution workshops.

Pilots and prototypes will be used to test the specifications that are being developed in the draft IRs. Depending on the nature of the pilots, they can also help in further developing and revising specifications. A typical pilot project is intended not only to provide a prototype but also to realise pre-operational components of INSPIRE.

Representative use-case scenarios and implementation solutions help to keep the data specification development process in line with the user needs. Use-case scenarios will describe cross border situations, address data sets covered by INSPIRE, and cope with multilingualism.

Pilots and prototypes are expected to demonstrate the feasibility and advantages of interoperability-based solutions for sharing spatial data and information services while observing the technical provisions set out in the INSPIRE Implementing Rules.

It is very important to check how the GCM and the specification development methodology can be applied in practice. Pilot specifications developed based on even a limited set of user requirements and the conceptual framework of INSPIRE are a valuable input to the process.

Likewise, before finalising the technical provisions of the IRs, it is very important to test them. Technical shortfalls and the likely impacts of implementation greatly contribute to the creation of the final versions. Cross theme consistency issues can be clarified through a use-case demanding integration of various datasets specified according to INSPIRE.

2.8.3 Timeframe of work

Any relevant project that runs within the specification period (until 2012) could contribute. Contribution to testing the applicability of the GCM and the specification development methodology are expected in the second half of 2007. Testing IR is foreseen starting from November 2008 – January 2009.

2.8.4 Terms of Reference

The tasks and role of projects pilots and prototypes can be defined as follows:

- to develop representative use-case scenarios
- *to develop data specifications that will become part of the IRs*
- to demonstrate the feasibility and advantages of interoperability-based solutions
- to test the applicability of the GCM and the specification development methodology
- to acquire experience in implementing the specifications included in the drafts,
- to check consistency between IRs,
- to determine the impact of implementing specifications.