Implications of the INSPIRE Directive

A DNF White Paper

Responsibility for Content

The DNF Expert group is responsible for the content of this document.

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1 Implications of the INSPIRE Directive

This DNF White Paper is one of a series addressing leading issues relating to location-based or spatial data in digital form. The subject of this paper is the INSPIRE Directive - the European legislation aimed at creating a spatial information infrastructure, the implications for UK of its implementation and how adopting DNF principles could assist in that process.

The purpose of this paper is to:

- Briefly describe INSPIRE - its aims, objectives and scope;
- Explain the impact that this will have in UK at a national and local level;
- Say what has happened to date – the current status and what is going to happen in the future;
- Indicate how and where adoption of DNF principles might assist organisations meet their INSPIRE objectives.

Readers unfamiliar with the Digital National Framework and the terminology used are recommended to go to the DNF website at http://www.dnf.org. Further information on INSPIRE is available at http://www.ec-gis.org/inspire/ .

2 What is the INSPIRE Directive?

The INSPIRE Directive is a major piece of European legislation aimed at the creation of a European spatial information infrastructure within the European Community. It came into force on 15th May 2007[1]. Although this legislation is in support of European policy on the environment, it is likely to have wider implications in terms of the way that spatial information, at least from public bodies, is made available and accessible in Europe. The European legislation has to be transposed into UK legislation by May 2009.

INSPIRE will deliver integrated spatial information services which will allow users to identify and access spatial or geographic information from a wide range of sources from local to European-wide. Some degree of interoperability using data from different sources is expected. The target users of the INSPIRE services include policy makers, planners and managers at European, national and local level but also the general public.

[1] The full text of the Directive 2007/2/EC is at: http://www.ec-gis.org/inspire/directive/l_10820070425en00010014.pdf

Services will include catalogue or metadata services to identify information sources, visualisation of information layers, overlay of information from different sources and spatial and temporal analysis.

Key points in the Directive are:

- The focus is on data in support of the environment;
- It applies to data held by public authorities (and certain third parties);
- It is up to individual States to create their own spatial data infrastructures (SDIs) to promote data sharing and interoperability within their own borders;
- It is aiming for compatibility within the Community and across its boundaries;
- The legislation is not about collection of new data rather about harmonisation and sharing of what exists currently within the Community;
- Certain data themes are set out and these are given various priorities. These themes can be grouped into Infrastructure – Annex 1, land (and sea) – Annex 2 and natural and human factors – Annex 3;
- Network services to discover, transform, view and download spatial data invoke spatial data and e-commerce services are mandated but only at the Community level;
- Beyond the establishment of a Community portal, it is up to member states how they provide access. They may create national portals but there is no legal requirement to do so.

3 Why INSPIRE?

Geographic information within Europe is highly fragmented with many datasets and sources. There are gaps in availability of certain themes on the one hand and redundancy on the other. There is duplication of information collection in some cases. Harmonisation between datasets at different scales is often lacking. Co-ordination across borders and between different levels of government is deficient. Standards are also lacking leading to incompatible information and information systems. Much existing data is not reusable. In addition there are various policy, institutional and commercial restrictions on access to data. Also what data there is can be difficult to identify, access and use. INSPIRE aims to remove many of these barriers.

4 How will it work?

The main components of INSPIRE are shown in Figure 1. The **INSPIRE Directive** is the basis of the whole initiative, it establishes the need for **technical documentation** of which the most important are the **Implementing Rules** (IRs). These set out basic requirements for data and services and the **Data Specifications** for each of the themes named in the Directive. The documentation conforms to a **Generic Conceptual Model** - essentially a reference model.

The Directive requires transposition into **National Legislation** which will mandate the Directive within each of the countries of the European Community. A technical infrastructure will be established at European level for **Data** and **Information** services. It will be up to the **European States** to expose their data conforming to the IRs and the data specifications to this service. It will then be available to **INSPIRE users** who will be able to discover, transform, view and download the data which will be freely available but not necessarily available free.

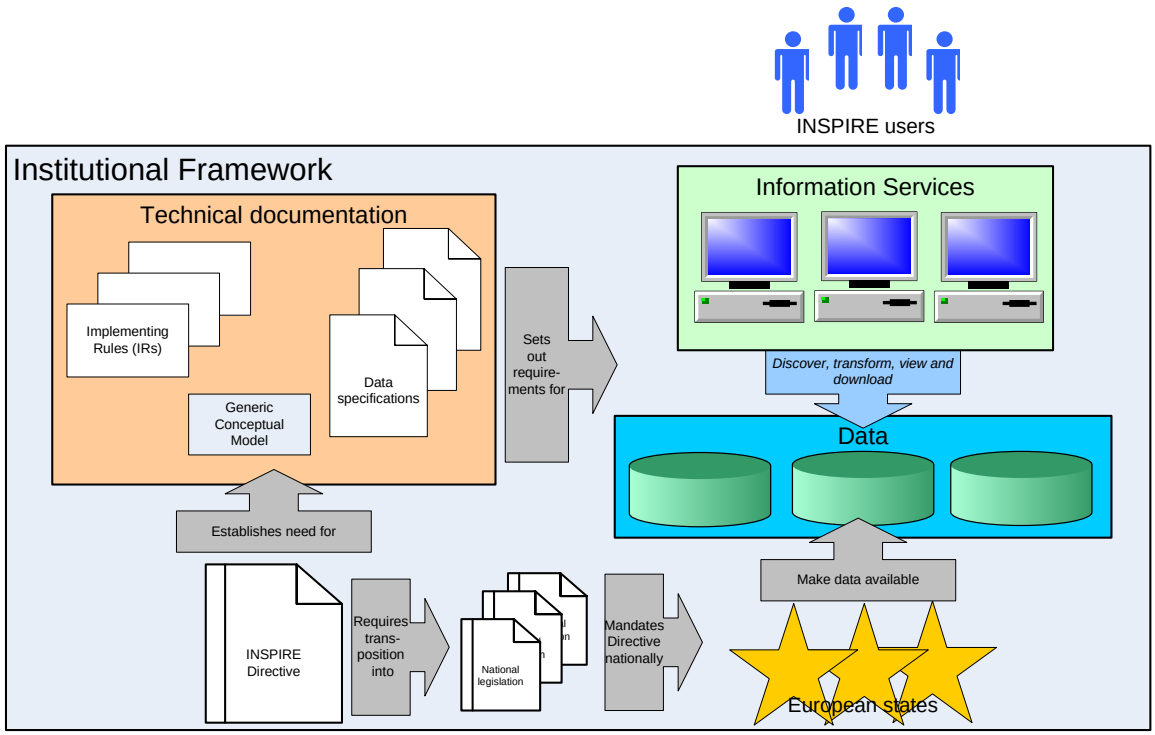

Figure 1: the main components of INSPIRE

INSPIRE is now in the *Transposition Phase*, the Directive must be transposed into the national legislation by May 2009. The IRs will be adopted by a committee process within Europe. Work on the IRs is already well advanced with drafts of the Generic Conceptual Model, metadata, methodology for data specifications and network services (discovery

and view services) issued for review and comment. The working groups for developing the data specifications for each of the themes[2] in Annexe 1 of the Directive have started work. The *Implementation Phase* will commence in 2009 and run until 2013 with a phased adoption of the IRs and inclusion of more data themes. This phase will overlap with a *Compliance Phase* running from 2010 to 2019.

The development of the technical documentation is being supported by two groups: (i) the Legally Mandated Organisations (LMOs) which are, as the name would suggest, those organisations that have official responsibilities for the creation of data and information within scope of INSPIRE and (ii) the Spatial Data Interest Communities (SDICs) which are any groups that have an interest in the INSPIRE initiative.

5 What are the implications for UK?

UK will have to build a spatial data infrastructure at least to the extent it will need to make available spatial datasets for each of the themes mandated in the Directive. These themes will be made available progressively and should conform to the INSPIRE data specifications. These datasets and their metadata will then have to be maintained.

The themes will need to made available either directly to a European INSPIRE portal or, if UK so chooses, via a UK portal supporting discovery, transformation, viewing and download.

INSPIRE will impact mainly and directly on public bodies owning or responsible for datasets relating to themes in scope of the Directive including; central government departments, devolved government departments, government agencies, local government.

Thus far UK has been active in the INSPIRE process. UK has been well represented on the Drafting Teams working on the IRs and also has good representation on the Thematic Working Groups which are developing the data specifications. Feedback via UK SDICs and LMOs[3] has also been strong. (DNF is registered as an SDIC and has given feedback for example.)

Defra are providing the UK lead for the transposition phase and there is a Transposition Project Board. Local Government Association (LGA) and the Improvement and Development Agency (IDeA) are looking at implications for local authorities. AGI has an INSPIRE Action Working Group.

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[2] These themes are: coordinate reference systems, geographical grids, geographical names, administrative units, addresses, cadastral parcels, transport networks, hydrography, protected sites.

[3] For a full list of LMOs and SDICs go to http://www.ec-gis.org/inspire/ir/index.cfm

6 How can DNF help?

There is a great deal of overlap between the aims of INSPIRE and those of DNF albeit that the former is concerned with Europe and the latter with UK. Both have the common aims of promoting and facilitating data sharing and interoperability, both have adopted a pragmatic approach to achieving these ends. Adopting DNF principles is likely to considerably aid the process of moving towards conformance to INSPIRE.

Similarities of approach include

- Providing a framework for the better integration of data;
- Using location as a common denominator;
- Linking different views of the world to a common base – central to DNF, facilitated within INSPIRE;
- Locational objects referenced through unique identifiers;
- Cross-referencing to a standard reference base using unique identifiers – central to DNF and facilitated in INSPIRE;
- Use of international standards, primarily those in the ISO 19100 series;
- Linking and exchange of information;
- Consistent forms of georeferencing to provide information integrity;
- Associating data from different sources;
- Supporting information transfer;
- Sharing or using data in conjunction with others in cross-organisational applications.

Table 1 overleaf indicates where there is overlap between INSPIRE and DNF using the INSPIRE data harmonisation components as the units of comparison. Also indicated is how DNF might help in moving towards INSPIRE.

Table 1: INSPIRE harmonisation components compared to DNF principles

INSPIRE harmonisation component	Comparison with DNF principles	How DNF might help
Rules for application schemas and feature catalogues – provision of a computer readable data description defining the data structure and the creation of feature catalogues to define the types of "spatial objects"[4] and their properties	DNF does not deal specifically with the creation of application schemas, as such. It does however promote the creation of feature catalogues to define reference objects	1. DNF feature cataloguing tool conforming to ISO 19110 – downloadable from the DNF website 2. DNF Technical Guide to feature cataloguing (in preparation)
Coordinate referencing and units of measurement model - methods for spatial and temporal reference systems as well as units of measurements – including the parameters of transformations and conversions.	DNF promotes the use of internationally recognised coordinate reference systems	1. DNF website lists commonly used coordinate reference systems in the British Isles and their parameters. This service is being developed to provide links to definitive transformation services 2. DNF Technical Guide to Coordinate Referencing Systems & Transformations
Object referencing modelling – the referencing of information to existing objects – typically base topographic objects	This concept is at the core of DNF and its principles are predicated on the associating and cross-referencing of business objects to reference objects and then onto base reference objects	1. DNF Technical Guide – DNF Association Model 2. DNF Technical Guide to cross-referencing (in preparation)

[4] "Spatial object" = geographic object or feature type

INSPIRE harmonisation component	Comparison with DNF principles	How DNF might help
Identifier management – "spatial objects" will have an external object identifier	This is also a fundamental principle of DNF	1. DNF Technical Guide – Unique Object Identifiers 2. Registry on DNF website containing a register of unique organisation prefixes
Registers and Registries – registers to include: all reference systems used in spatial data sets; all units of measurement used in spatial data sets; all codelists / thesauri used in the application schemas; the feature concept dictionary for elements used by application schemas; identifier namespaces; all feature catalogues; all application schemas of all reference systems used in spatial datasets	DNF promotes and facilitates the creation of registers and registries although not on as wide a scope as is envisaged by INSPIRE. Registers of organisation prefixes, feature catalogues and coordinate reference systems already exist	Registry on DNF website: 1. Lists commonly used coordinate reference systems in the British isles and their parameters 2. Contains a register of unique organisation prefixes 3. Allows organisations to create and register feature catalogues describing the geographical data that they publish.
Metadata – covers metadata on the following levels: Discovery; Evaluation; Use. Metadata associated with individual spatial objects will in general be described as part of the application schema	Although metadata is within scope of DNF, technical guidance and tools have not been developed to date. DNF will adopt the UK GEMINI standard which is being aligned to the INSPIRE metadata IR	

INSPIRE harmonisation component	Comparison with DNF principles	How DNF might help
Maintenance - defines best practice in ensuring that application data can be managed against updates of reference information without interruption of services. Includes change only updates; versioning of objects (and their properties); object lifecycles and propagation of changes between objects	This corresponds with DNF principles in terms of the need to version objects and define life-cycles	Guidance under development
Data & information quality – publication of quality levels of each spatial dataset using the criteria defined in the ISO 19100 series of standards, including completeness, consistency, currency and accuracy.	DNF promotes the publication of quality statements.	Guidance planned
Data transfer - methods for encoding application and reference data	DNF has developed an XML schema for transfer of simple cross-references but is not intending to develop schemas for transfer of complete datasets	Trial XML schema available on the DNF website
Conformance – describes how conformance of data to a test specification is tested	DNF is developing a conformance model	General guidance available in the DNF Overview document

The documentation and services being developed by DNF are illustrated on the Roadmap shown in Figure 2. Existing documentation and services are available on the DNF website.

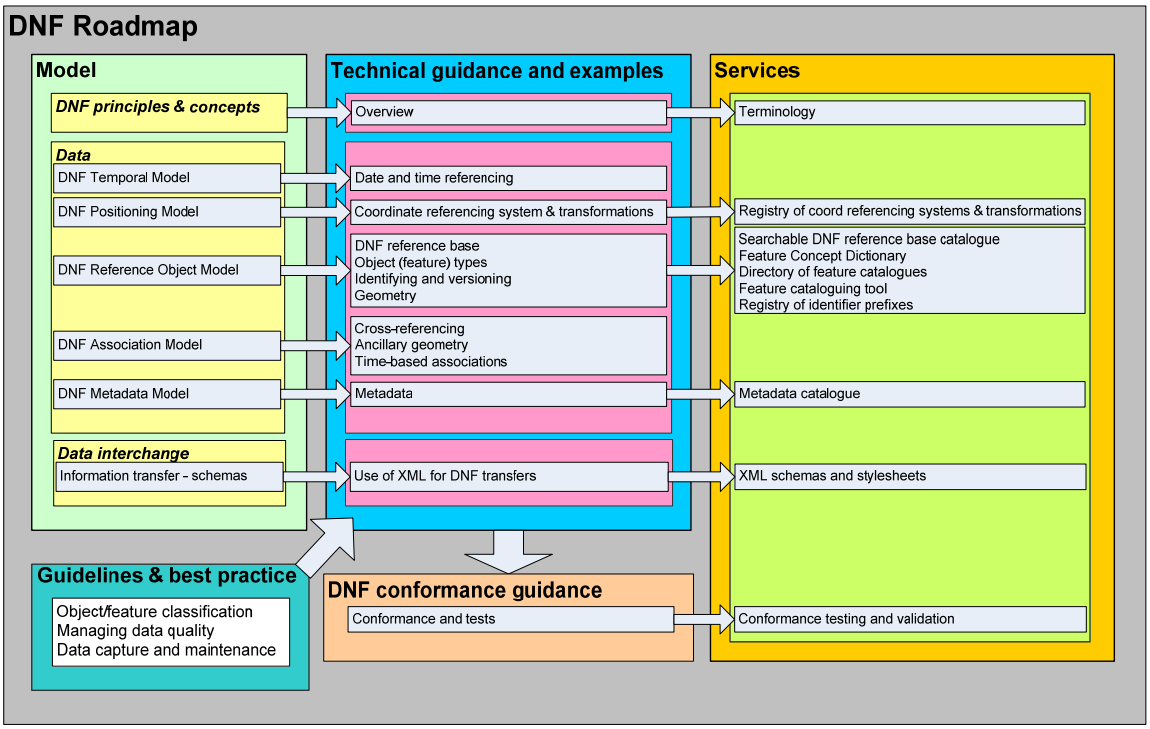

Figure 2: DNF Roadmap

7 Conclusions

INSPIRE will present considerable challenges in UK as in other European countries, the full implications are only now being realised. Many of the principles of DNF, the data sharing and interoperability, are close to those being evolved for INSPIRE. Thus some of the issues, particularly those at the practical level, have already been looked at by DNF which means that this experience and the resulting guidance should be exploitable by those in UK involved with INSPIRE.

8 References

Publications

2007	Digital National Framework	Overview V2.0
2006	Digital National Framework	Association Model V1.0
2007	Digital National Framework	Unique Object Identifiers – Technical Guide V1.1
200	Digital National Framework	Coordinate Referencing Systems & Transformations – Technical Guide V1.0
2007	INSPIRE	Generic Conceptual Model of the INSPIRE data specifications V2.0

Web References

Year,	Reference	Web Address
2008	Digital National Framework	www.dnf.org
2008	Digital National Framework Registry	http://www.dnf.org/Pages/registry/
2008	DNF Demonstrator	http://www.mgeomatics.com/DNFDemo
2008	INSPIRE website	http://www.ec-gis.org/inspire/