Spatial Data Infrastructures in *The Netherlands:* State of play 2010

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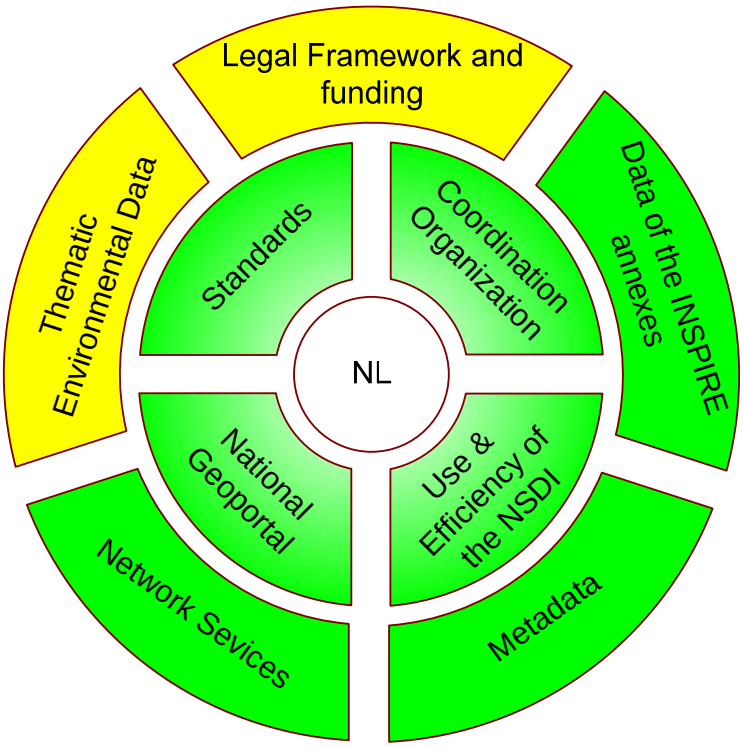
Change matrix 2010 versus 2007

A concise graph is added to indicate changes of the various paragraphs compared to the previous report. Two colours are used: Green and Yellow indicating major and minimum changes respectively compared with the 2007 State of Play. This graph does not reflect the country situation. Merely it represents our findings/changes per section on our preparation of the desktop analysis



Executive summary

The Dutch NSDI can be described as the result of various initiatives taken in a bottom-up approach for more than 15 years. Different stakeholders take initiatives and eventually reach agreements for collaboration and elaboration.

In 2006 The GI-Board ('GI Council') was created. All ministries and agencies involved in the SDI (development and use) are represented in this board. Next to the GI-Board, the GEONOVUM foundation plays an important role in the Dutch Geographic Information Infrastructure. Together they took over the role of RAVI and the NCGI. GEONOVUM's key tasks are: representing the Dutch geo-information community; standardization, creating and maintaining a national portal; the operational INSPIRE coordination; and international networking. The political responsibility for GEONOVUM also lies with the minister of housing, spatial planning and environment. The foundation is funded by the ministry of housing, the ministry of agriculture, the ministry of traffic, the cadastre and TNO-NITG.

The Ministry of Housing, Spatial Planning and the Environment has introduced the following policy measures:

- boosting innovation and knowledge development in the professional geo-field with a substantial subsidy to the Space for Geo-Information (RGI) programme;
- founding the GI Council, with strategic advisory duties;
- forming GEONOVUM, a new foundation of public sector parties, created with support from the Ministry of Housing, Spatial Planning and the Environment and others;
- arranging for formal consultation with industry, the geoprofession and the academic world in the Geo-meeting;
- defining the legal framework for, and implementing, various key registers.

Pursuant to advice from the GI Council, the GEONOVUM and RGI foundations have devised an approach and strategy in consultation with parties in the Geo-meeting. The result is known as GIDEON and was established in 2008. GIDEON implementation will produce a national facility for location-specific information and sets the approach and implementation strategy for the years 2008 – 2011.

The size of the Dutch geo-information sector is already at least 1.5 billion euros, and employs 15 thousand of people. Various parties are working together on the execution of parts of GIDEON in seven implementation strategies. Jointly, these strategies will lead to the creation of a key geo-facility for the Netherlands.

The seven strategies are as follows:

1. to give geo-information an appropriately prominent place within e-services;
2. to encourage the use of the existing four key geo-registers, and to set up two new ones;
3. to embed the INSPIRE Directive into Dutch legislation and to implement the technical infrastructure;
4. to optimize supply by forming a government-wide geo-information facility, which is to include geo-data standardization, new infrastructure, and collaborative maintenance;
5. to encourage the use of geo-information in numerous government policy and implementation chains, such as safety, the sustainable living environment, mobility, and area development;
6. to create a favourable climate for adding economic value to available public authority geo-information;
7. to encourage collaboration in knowledge, innovation and education, for the permanent development and renewal of the key geo-information facility for the Netherlands.

As far as the INSPIRE transposition is concerned, this has been concluded and a final text has been published

A national Geo-Portal exists since 2008 that addresses the broader NSDI and is updated every 3 to 6 months. Currently it holds around 900 datasets.

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Abbreviations and acronyms

AKR	Automated Cadastral Register
BBR	Register of enterprises/companies
BGI	Bedrijvenplatform Geo-Informatie
BGR	Register of buildings
BRA	Register of standardised addresses
BSIK	Besluit Subsidies Investeringen in de Kennisinfrastructuur
bnSP	de Beroepsvereniging van Nederlandse Stedenbouwkundigen en Planologen
BZK	Ministry of the Interior and Kingdom Relations
CBS	Centraal Bureau voor de Statistiek
CPB	Netherlands Bureau for Economic Policy Analysis
CT	Core Thematic Data
DLG	Dienst Landelijk Gebied
DR	National Service for Implementation of Regulations
DURP	Digitaal Uitwisselbare Ruimtelijke Plannen
ECU	European Currency Unit
FGDC	Federal Geographic Data Committee
SC-DLO	DLO-Staring Centrum
GBA	Register of persons
GBKN	Grootschalige Basiskaart Nederland
GDI R&C	Geodata Infrastructuur Rampenbestrijding en Crisisbeheersing
GI	Geographical Information
GIDEON	Geographical information and services for e-government in the Netherlands
GIS	Geographical Information System
GML	Geography Markup Language
GPS	Global Positioning System
IMRO	Informatiemodel Ruimtelijke Ordening
IMWA	Informatiemodel Water
INSPIRE	INfrastructure for SPatial InfoRmation in Europe
IPO	Interprovinciaal Overleg
ISO	International Organization for Standardization
KNMI	Royal Netherlands Meteorological Institute
LBG-RIVM	Laboratorium voor Bodem- en Grondwateronderzoek van het RIVM
LKI	Cartographic Information system
LNV	Agriculture, Nature and Food Quality

LSV-GBKN	Landelijk Samenwerkingverband - National Cooperation GBKN
MinVROM	Ministry of Housing Spatial, Planning and the Environment
MNP	Netherlands Environmental Assessment Agency
NCGI	Nationaal Clearinghouse Geo Informatie
NGII	National Geographic Information Infrastructure
NGR	National Georegister
NIROV	Nederlands Instituut voor Ruimtelijke Ordening en Volkshuisvesting
NITG	Nederlands Instituut voor toegepaste Geowetenschappen
NIVR	Netherlands Agency for Aerospace Programmes
NMA	Topographical Service
NSDI	National Spatial Data Infrastructures
OOV	Openbare Orde en Veiligheid (Public Order and Safety)
OWS	OpenGIS Webservices
PPP	Public-Private Partnerships
PSI	Policy and legislation on access to public sector information
RAVI	Dutch Council for Real Estate Information
RD	Rijksdriehoeksstelsel
REF	Reference data
RGD	Rijks Geologische Dienst
RGI	Space for Geo-Information
RIVM	Rijksinstituut voor Volksgezondheid en Milieu
RPB	Netherlands Institute for Spatial Research
RWS	Directorate-General for Public Works and Water Management
SAG	Samenwerking Aardkundige Gegevens
SDI	Spatial Data Infrastructures
SVI	Structure Outline for Geographic Information
TDN	Topografische Dienst Nederland (Topographical Service of the Netherlands)
TNO	Netherlands Organization for Applied Scientific Research
TNO GG	TNO Grondwater en Geo-Energie
UvW	Association of Water Boards
V&W	Traffic, Public Works and Water Management
VNG	Vereniging van Nederlandse Gemeenten
VROM	Ministerie van Volkshuisvesting, de Ruimtelijke Ordening en het Milieubeheer = Ministry of Public Health, Spatial Planning and Environmental Affairs
WBP	Wet Bescherming Persoonsgegevens
WFS	Web Feature Service

1 GENERAL INFORMATION

1.1 Method

This report is summarizing the review of SDI in The Netherlands, and reflects the degree to which the SDI situation in The Netherlands is similar to the ideas set out in the INSPIRE position papers1 and in the more recent INSPIRE scoping papers.

The 2002 report was based on the analysis of various documents, project references and web sites readily accessible as well as comments received from representatives of the Technical University Delft and RAVI.

Since in the Netherlands a well defined NSDI-initiative is in place for more than 15 years, attention was focused on documents outlining this:

- Structure Outline for Geographic Information (SVI, 1992);
- National Geographic Information Infrastructure (NGII, 1995);
- RAVI policy plan 1997-2000 (RAVI, 1996);
- Draft Future Visions of the coordinating minister on GI (MinVROM, 1998).

The report has been completed by integration and consolidation of comments received from different stakeholders and experts. Those comments were provided either in written form 2003 (spring and fall 2003), either through interviews organized in the framework of the Activity 2 of the State-of-Play project in April-May 2003. For the review of 2005, no input from the Dutch experts was received. It was however confirmed that within the NSDI of The Netherlands, important discussions were going on regarding the way the SDI should be organized. According to Prof. Bas Kok, these discussions were still ongoing and premature to be integrated in the report. Based on some other information sources, some of the legal paragraphs were modified to reflect changes that took place over the last year.

In 2006, most of the organizational changes have been finalized and were integrated in the 2006 version of the report. Information was obtained through the University of Wageningen and from the website of RGI, the governmental initiative which aims at supporting GI and SDI development in The Netherlands. Additional information was received through several presentations at the EC GI&GIS workshop in Innsbruck (June 2006).

In 2007, information was received concerning the data sets and services of the NSDI, the data sharing practices and the organizational model. Two important documents were released in 2007: one was the Plan of the Ministry of Spatial Planning and Environment

[1] INSPIRE position papers, final versions: RDM, ETC, DPLI, ASF, IST, IAS (latest version).

(VROM) for the implementation of INSPIRE, and the other was a Framework for the technical implementation of INSPIRE.

In 2009, two key documents were used namely the GIDEON initiative from MinVROM, and the Implementing INSPIRE in the Netherlands paper (Grus et al., 2009). Furthermore, the detailed survey reply from GEONOVUM provided important updated information and resources. At the same time a number of presentations in various GI conferences/workshops were used as well as information from the National Geoportal and the Internet. Moreover, obsolete information from the previous versions was removed, while a conclusion paragraph regarding the status of each indicator was added for each component.

1.2 The NSDI-scene in The Netherlands

1.2.1 GI-Board, GEONOVUM and GIDEON

In 2006 the GI-Board ('GI Council') was created. All ministries and agencies involved in the SDI (development and use) are represented in this board. Next to the GI-Board, the GEONOVUM foundation plays an important role in the Dutch Geographic Information Infrastructure. Together they took over the role of RAVI and the NCGI.

GEONOVUM's key tasks are:

- to develop and standardise the geo-information infrastructure while also being innovative.
- to build up and disseminate knowledge in the area of geo-information infrastructure.
- to make the geo-information infrastructure more accessible to administrative bodies, institutions and departments in the Netherlands and the European Union.

In order to attain its goals GEONOVUM has set itself the following tasks:

- to share and make accessible all the geo-information available in the Netherlands.
- to be a think tank in the domain of geo-information.
- to be the 'voice of geo-information' that provides the minister of VROM and the Council for Geo-information with professional advice and relevant knowledge.
- to develop high-quality and widely applicable standards and to monitor their use.

The political responsibility for GEONOVUM also lies with the minister of housing, spatial planning and environment. The foundation is funded by the Ministries of Housing, Spatial Planning and the Environment (VROM), Agriculture, Nature and Food Quality (LNV) and Traffic, Public Works and Water Management (V&W), the land registry (Kadaster) and TNO.

Pursuant to advice from the GI Council, the GEONOVUM and RGI foundations have devised an approach and strategy in consultation with parties in the Geo-meeting. As a result GIDEON was created – an approach and implementation strategy for national facility for location-specific information (SDI). This vision was accepted in 2008 by the Dutch Cabinet and Parliament.

Part of GIDEON strategy is to embed the INSPIRE Directive into Dutch legislation and to implement the technical infrastructure (Grus et al., 2009). The objective of the strategy is to incorporate INSPIRE in to Dutch legislation by 2011, while creating the technical infrastructure in consultation with the professional field.

Jointly, these strategies will lead to the creation of a key geo-facility for the Netherlands.

The seven strategies are as follows:

1. to give geo-information an appropriately prominent place within e-services;
2. to encourage the use of the existing four key geo-registers, and to set up two new ones;
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6. to create a favourable climate for adding economic value to available public authority geo-information;
7. to encourage collaboration in knowledge, innovation and education, for the permanent development and renewal of the key geo-information facility for the Netherlands.

GIDEON was created thanks to the cooperation and commitment of a number of ministries, agencies and universities. Analytically:

- the Ministry of Housing, Spatial Planning and the Environment (VROM);

- the Ministry of the Interior and Kingdom Relations (BZK);
- the Ministry of Foreign Affairs;
- the Ministry of Defence;
- the Ministry of Agriculture, Nature and Food Quality (LNV), Government Service for Land and Water Use (DLG) and National Service for Implementation of Regulations (DR);
- the Ministry of Transport, Public Works and Water Management (V&W), Directorate-General for Public Works and Water Management (RWS);
- the Netherlands Bureau for Economic Policy Analysis (CPB);
- GeoBusiness Nederland;
- the Association of Provincial Authorities (IPO) and the provincial governments of North Brabant and South Holland;
- Kadaster;
- the Netherlands Environmental Assessment Agency (MNP);
- the Netherlands Agency for Aerospace Programmes (NIVR);
- the Netherlands Institute for Spatial Research (RPB);
- GEONOVUM;
- Space for Geo-Information (RGI);
- the Netherlands Organization for Applied Scientific Research (TNO);
- Alterra;
- the Association of Water Boards (UvW);
- Universities: TU Delft, Utrecht University,VU University Amsterdam and Wageningen University;
- the Association of Netherlands Municipalities (VNG) and the Municipality of Vlaardingen;
- Het Waterschapshuis.

GIDEON consists of three visible components (Figure 1). The core is formed by the data, which are divided into the statutory key geo-registers and the thematic data.

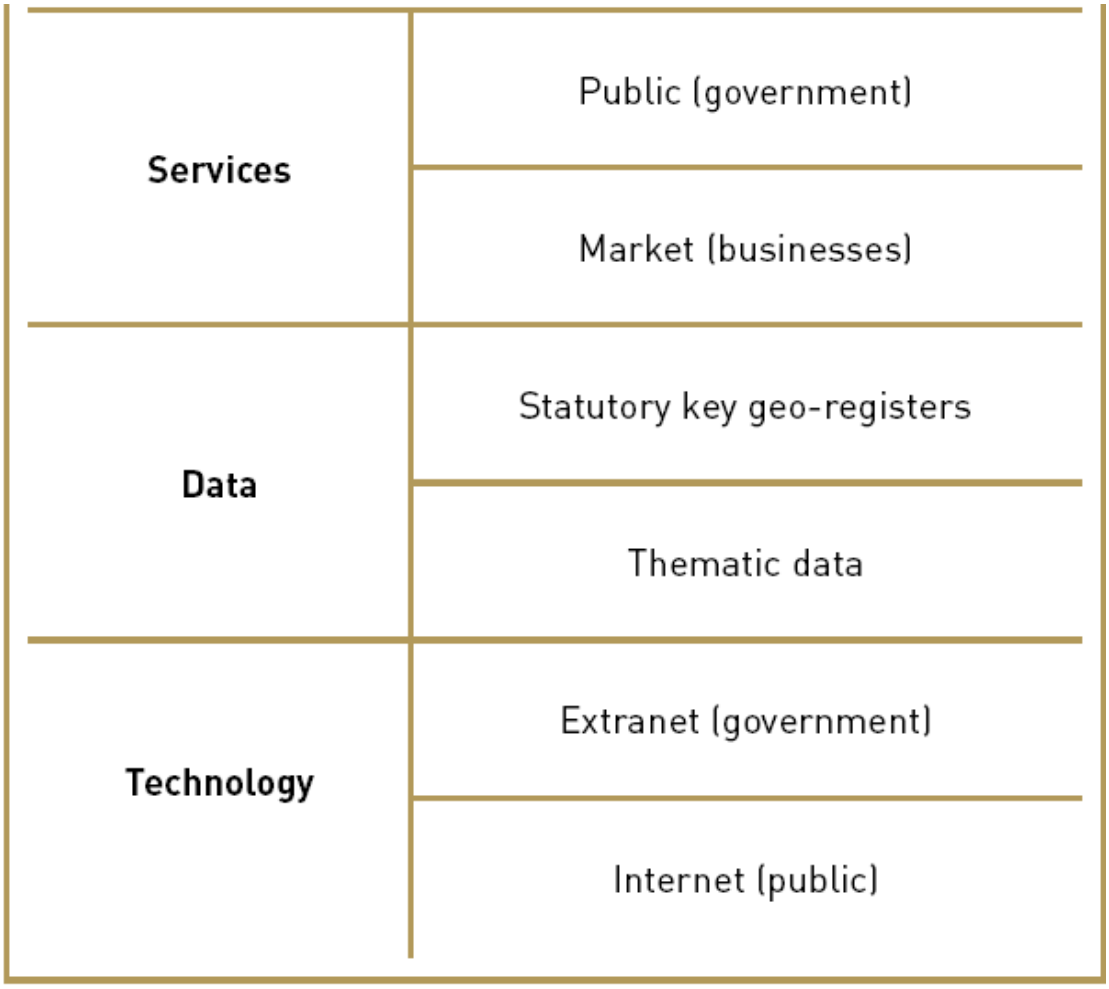

Figure 1. The visible components of GIDEON

There is no comprehensive master plan or blueprint for GIDEON. GIDEON will be implemented by following a realistic approach, involving stepwise construction of the infrastructure, while learning lessons from results achieved along the way.

By establishing a set of key registers, the government intends to improve services, reduce administrative burden, and organize its own operational processes more efficiently. This approach will make it possible to gather data once, and then use those data in multiple places within the government. The foundation for the set of registers has been laid in recent years. These geo-registers are the foundation of GIDEON.

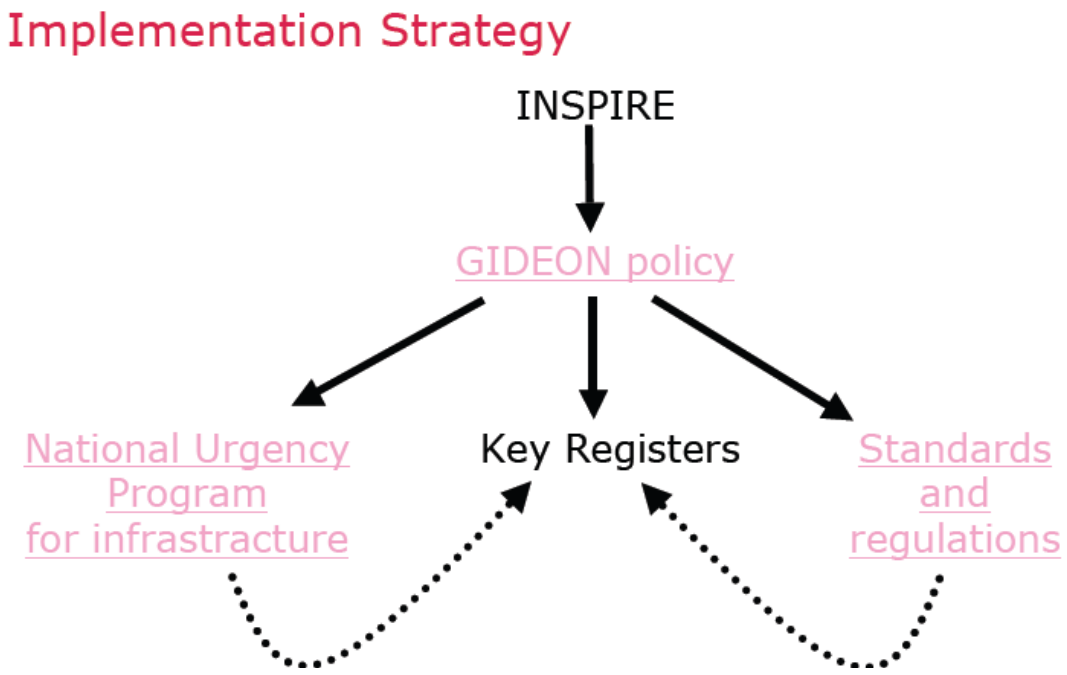

Figure 2. GIDEON implementation strategy (taken from Theory on Key Registers, SDI workshop in national government GSDI 11, 2009).

1.2.2 Other initiatives and actors

An initiative that builds on the NGII is the DURP project, the project for the digital exchange of maps of city planning (DURP: Digitaal Uitwisselbare Ruimtelijke Plannen). It aims to stimulate the local (municipalities), regional (provinces) and national authorities to produce their maps digitally in order to ease the access and exchange of the maps and data. The project is financed by the Ministry for Housing, Spatial Planning and the Environment and five other organisations:

- The Netherlands Institute of Housing and Planning (NIROV : het Nederlands Instituut voor Ruimtelijke Ordening en Volkshuisvesting) - http://www.nirov.nl ;
- Association of Dutch Municipalities (VNG - de Vereniging van Nederlandse Gemeenten (VNG)) - http://www.vng.nl ;
- Organisation for Interprovincial Conversation (IPO - het Interprovinciaal Overleg) - http://www.vernieuwingsimpuls.nl/pubipo.htm ;
- Association of Dutch Urban Designers (bnSP - de Beroepsvereniging van Nederlandse Stedenbouwkundigen en Planologen) - http://www.bnsp.nl ;

The Statistical Agency (Central Bureau for Statistics, CBS) is another major provider of GI.

However, with the national GEO-PORTAL most of the above partners joined and provide a concise and consolidated database. These organizations are now part of the National Georegistry.

Starting in 2009 all data providers, whose data were considered compulsory according to INSPIRE directive, will have to make them available accordingly. Around 20 organizations were identified and contacted by the ministry of VROM.

2 Details of the Dutch NSDI (NGII)

2.1 General information

The GI-Board is represented by all ministries and agencies involved in the NSDI. The GEONOVUM is the National Spatial Data Infrastructure (NSDI) executive committee in the Netherlands. The organisation was founded in spring 2007 and devotes itself to providing better access to geo-information in the public sector. GEONOVUM develops and manages the geo-standards necessary to implement this goal. The activities of GEONOVUM are subsidised by the Ministries of Housing, Spatial Planning and the Environment (VROM), Agriculture, Nature and Food Quality (LNV) and Traffic, Public Works and Water Management (V&W), the land registry (Kadaster) and TNO. Together they took over the role of RAVI and the NCGI. As a subsequent step towards the INSPIRE compliance and implementation the GIDEON paper came up in 2008 (VROM, 2008).

2.2 Component 1: Coordination and organizational issues

In September 2007 GEONOVUM, assigned by VROM, presented a plan for the implementation of INSPIRE in the Netherlands (http://www.GEONOVUM.nl/Download-document/61-Plan-van-Aanpak-INSPIRE-in-Nederland.html). Three phases are foreseen: preparation, execution and closure. GEONOVUM will execute the INSPIRE programme in the Netherlands.). Part of this programme is the development of the Dutch part of INSPIRE network, including national INSPIRE portal, connected to European INSPIRE-portal, filled with geo-data and metadata and properly managed. The programme will also deliver general terms and conditions for the use of INSPIRE network, geo-data and metadata and a basic service level agreement between data-providers and users.

GEONOVUM published its annual plan in March 2008 (http://www.GEONOVUM.nl/Download-document/86-Uitvoeringsplan-2008.html), based on the strategic agenda of the GI Council and the funding decisions of VROM.

The Ministry of Housing, Spatial Planning and the Environment is the ministry responsible for implementing INSPIRE legislation in the Netherlands. The Ministry of Housing, Spatial Planning and the Environment has requested GEONOVUM to manage the implementation process. The legislative process concentrates on the source data owners of the data covered by INSPIRE. The most important source data owners for INSPIRE are Kadaster the Ministry of Transport, Public Works and Water Management, the Ministry of Agriculture, Nature and Food Quality, the Ministry of Defence, TNO, Alterra, the Royal Netherlands Meteorological Institute (KNMI), Statistics Netherlands (CBS), provincial governments, municipalities and district water boards. Market parties may tie in with the facilities created within the INSPIRE framework.

Currently, each organisation has its own agreement and rules on data and service sharing. Generally, most datasets are exchanged between governmental organisations free of costs (except for Kadaster datasets). An agreement on standards and licences has been set for

all groups of stakeholders including the condition for usage. However, a number of conditions exist on the availability of data such as confidentiality of personal data (e.g. cadastral data, data from the Ministry of Agriculture and Nature and Food Quality). At the same time third parties economic interest raise a question on the fairness of freely available data and the issue has still to be resolved.

Regarding the implementation strategy the Dutch national vision for geoinformation is reflected on the GIDEON document for the years 2008-2011. (http://www.GEONOVUM.nl/sites/default/files/GIDEON_Engels_0.pdf).

A number of organizations (about 20) have been involved in the implementation strategy from National to local government, to universities and Geobusiness NL (an umbrella organization for private sector GI organizations).

The main objectives are:

- To incorporate the INSPIRE Directive into Dutch legislation by 2011, and create the technical infrastructure in consultation with the professional field. The implementation will maintain compatibility with the national key facilities.
- The Ministry of Housing, Spatial Planning and the Environment aims through INSPIRE implementation to enhance the range, quality, and availability of geo-information.

While the Milestones are:

- 2009: Completion of INSPIRE legislative process.
- 2010: Metadata available for Annexes I and II. Search, view and download services available.
- 2011: Operational INSPIRE portal linked to national georegister.

IN 2008 the geoportal was created and all the organisations providing geo-data (INSPIRE compulsory or not) are included in the national georegistry of the Netherlands.

The transposition has been concluded and a final text has been published. (http://wetten.overheid.nl/BWBR0026158/geldigheidsdatum_15-12-2009) An issue of interest that alerted the Dutch House of Commons (Tweede Kamer) was about the cost aspect. Therefore they pointed out that INSPIRE should be implemented up to the necessary-compulsory level. An additional cost-benefit analysis was requested by the member of the parliament and was executed at the end of 2009. It was noted that no changes to the existing legislation were incorporated due to the INSPIRE directive.

2.2.1 Conclusions of Component 1

The approach and territorial coverage of the SDI is truly national and a number of the SDI components have reached a significant level of operationality. GEONOVUM is the official recognised coordinating body of the SDI and although is not controlled by users there are indirectly represented. Producers and users are participating in the SDI while there is involvement of non-public sector actors such as universities, Geobusiness NL.

Based on these conclusions we score the indicators as follows:

- The approach and territorial coverage of the SDI is truly national
- One or more components of the SDI have reached a significant level of operationality (5)
- The officially recognised or de facto coordinating body of the SDI is a NDP, i.e. a NMA or a comparable organisation (No)
- The officially recognised or de facto coordinating body for the SDI is an organisation controlled by data users (No)
- An organisation of the type 'national GI-association' is involved in the coordination of the SDI
- Producers and users of spatial data are participating in the SDI
- Only public sector actors are participating in the SDI (No)

2.3 Component 2: Legal framework and funding

2.3.1 Legal framework

MinVROM is the formal responsible for GI-related matters in The Netherlands.

The results of the NSDI-initiative are partially integrated in legal instruments:

A key element of the NSDI is the "authentic registers". Authentic registrations are registrations with a uniquely defined core dataset, which government agencies are obligated to use. The collection and maintenance of the data is regulated in legislation, the data certified as accurate and current, and the producer assumes all liability for its use by others. Access to data in authentic registers should be conformal the guidelines presented in the memorandum towards accessible government (transparency on data policy). Its users are obliged to report incorrect information to producers, and there is a stringent policy on quality assurance.

The authentic registrations include several datasets that can be considered as geographic datasets. First, the law making Top10NL of the Cadastre the authentic registration for topography was adopted in January 2008 by amendments to the Law on the Cadastre. From 1 January 2009, all public bodies in the Netherlands are under an obligation to use it. Local authorities that had their own 1:10.000 topographic maps had to make the switch by 1 January 2010. In addition, the derived 1:50.000, 1:100.000, 1:250.000, 1:500.000 and 1:1.000.000 are also part of the authentic registration for topography. A convenant was signed between the Ministry of VROM and the Cadastre about the maintenance of the registration.

Second, the authentic registration for addresses and buildings was included in the law of 24 January 2008 (which was amended on 14 February 2009). The law entered into force on 1 July 2009, and the local authorities are since then under the obligation to deliver their address and building data to the national registry. From 1 July 2011, the registration has to be used by all public bodies.

For the third authentic registration, the large-scale topography (1:500 to 1:5.000), draft legislation was intended to be issued in early 2010.

The fourth authentic registration, subsurface, will be fully operational by 2013. This was approved by a Decision from the cabinet in December 2008.

Another important legal instrument is the law 2 July 2009 transposing the INSPIRE directive into Dutch law. The law stays close to the directive, requires the public authorities to create metadata and gives everyone the right to use the network services. The rules for sharing data have to be set up by a ministerial decree.

2.3.2 Public-private partnerships (PPP's)

In 1975, by Royal Degree, the Large Scale Base Map of the Netherlands (GBKN - Grootschalige Basiskaart van Nederland) was established. After a long period of development, in 1992 the LSV-GBKN (Landelijk Samenwerkingverband - National Cooperation GBKN) was established which finished the production of the GBKN in 1999. The LSV-GBKN was a national joint venture with 11 regional joint ventures. The production costs are €20 million and nationwide fully covered. It is a PPP of the municipalities, utility companies, water boards, the Dutch Cadastre and the Dutch administration. After the GBKN moves to the authentic registration large scale topography, the maintenance will be a public task and the PPP construction will no longer be maintained.

Between 2001 and 2007, the private company Geodan had taken over the exploitation and the management of the NCGI. From 2007 onwards, the NGCI was replaced by GEONOVUM.

2.3.3 Policy and legislation on access to and re-use of public sector information (PSI)

The legal basis for access to public information is the Government Information Public Access Act of 31 October 1991. This act replaced the Act on Public Access to Information of 9 November 1978. It creates a presumption that documents created by a public agency should be available to everyone. The law provides for access to information that is crucial in the decision making process of the administration. The price to be paid for this information is based on dissemination cost. It is reasoned however that the electronic geographic data cannot be obtained through a request based on this Act. Government agencies can claim copyright or database right on their data and most of them do so. Moreover, citizens or businesses cannot access entire databases because -according to current interpretation- the Government Information Act does not apply to complete databases.

Directive 2003/4 on access to environmental information was implemented in Dutch law by the Act of 30 September 2004, modifying the Government Information Public Access Act, the Act on environmental management and other Acts.

The Government Information Public Access Act has been revised to include the implementation of Directive 2003/98 on the re-use of PSI. In 2009, the Ministry of Internal Affairs announced that it would review the legislation implementing the PSI directive. While the Dutch policy already went beyond the minimum requirements of the directive (thanks to the policy document 'Naar de optimal beschikbaarheid van overheidsinformatie – Towards the optimal availability of public sector information), this will be translated into the legislation. The new legislation is intended to be brought before Parliament before the end of 2010. Its main principles are: the adaptation of the pricing principle towards the charging of only marginal costs; the banning of public sector bodies to use their intellectual property rights to impose conditions on re-use; and the creation of transitory rules for a number of data collections, including the Cadastre, allowing for the adaptation of their funding model.

2.3.4 Legal protection of GI by intellectual property rights

Copyright is primarily regulated by the Copyright Act of 1912. The 2001 directive on copyright in the information society has been included into national legislation.

In principle, copyright is applicable to all government information -with the exception of official texts of legislation, judicial decisions and administrative decrees-, although copyright must be claimed explicitly by the government for the protection to be effective and a copyright sign (©) has to be placed on the work. Commercial use of the data for which copyright is claimed by an administrative agency is only allowed when the agency concerned gives its consent.

Due to their factual and standardized character geographic information often does not meet the requirements of originality required by copyright. However, common law shows that geo-information with a personal view can still be protected by copyright.

Based on the European Directive on the legal protection of databases (96/9/EC), the 1912 Copyright Act was amended and a Dutch version of the Directive, the Database Law, enacted in 1999. The new law protects the producer of a database which shows that there has been qualitatively and/or quantitatively a substantial investment in either the obtaining, verification or presentation of the contents. Government agencies explicitly have to reserve their rights. In a Decision on a case between the City of Amsterdam and Landmark, the Council of State (the highest administrative court) decided that the city could not be considered a producer of the database, because it did not bear the risk of the substantial investment in the database, as the data was partially obtained from the national ministry, and partially paid for by the city of Amsterdam in order to facilitate the performance of its public task. The court found that there was no financial risk, so the city could not invoke its database right to impose conditions on the re-use by Landmark.

The new legislation on PSI will ban the public sector bodies from using their intellectual property rights to restrict the re-use of their data.

2.3.5 Restricted access to GI further to the legal protection of privacy

The Netherlands Data Registration Act was passed in 1989 and applies to all collections of personal data, regardless of residency status in the Netherlands. It also applies to foreign files having a Dutch file controller and containing personal data about Netherlands residents. A new Personal Data Protection Act (*Wet Bescherming Persoonsgegevens – WBP*) was approved by the parliament in June 2000 and implements EU Directive 95/46/EG. It came into force on 1 September 2001.

Although geographic data primarily focuses on geographic objects and not on natural persons, and even might be presented in an anonymous way, an operator can often easily relate these data to natural persons. In most cases the law concerning privacy protection is therefore applicable to geo-information. Hence, each organization or business should notify persons that they have been registered and for what purpose.

Directive 2002/58 on privacy and electronic communications has been implemented in national law by several regulations and an act of 22 April 2004 in particular. For an overview of the acts implementing this directive, see http://europa.eu.int/information_society/policy/ecomm/doc/implementation_enforcement/country_by_country/netherlands_2002_58.pdf.

Particular attention to privacy and personal data is also paid in the legislation on the authentic registration for buildings and addresses. Data from the registration that can be considered as personal data can only be transferred to parties that are authorised to process personal data under the privacy legislation.

2.3.6 Licensing framework

GEONOVUM, in cooperation with T.U.Delft, has started working on a licensing model based on creative commons, called *Geo gedeeld*. It proposes four sets of standard

licensing conditions. All licences contain an obligation of attribution, and may contain one or more of the following conditions:

- Permission is required to make the data available to third parties or to create derived products;
- The licence has a limited duration;
- A charge has to be paid for using the data.

The model was discussed with the data holders and adapted to their needs. It will be implemented in the course of 2010.

2.3.7 Funding model for SDI and pricing policy

Funding

NCGI was financed until 2000 by its founding members, the RAVI and the MinVROM. Between 1997 and 2000 1.5 million ECU, not including costs for metadata and conversion, have been invested in the project. As from 1 July 2001 the private company Geodan has taken over the exploitation and the management of NCGI. Financing comes now from project- and theme 'owners'.

The general funding (€ 1 million each year) of the coordinating role of RAVI in building the NGII comes from its participating parties and the MinVROM. Contribution of the latter is decreasing. Funding is targeted mainly towards:

- Standardization of GI;
- Legal aspects and arrangements;
- Toning data sets and establishing relationships between the fundamental data sets;
- Raising political awareness;
- Further developing the Knowledge Infrastructure.

As it was planned, GEONOVUM took over the role of RAVI and NCGI. Currently, its budget is set at 700.000 € to become available from 2011 and beyond.

The funding for INSPIRE implementation is mainly directed to:

- coordinating body/structure
- service development
- setting-up registers

- other components of the infrastructure (e.g. monitoring and reporting)

The Ministry of Housing, Spatial Planning and the Environment has reserved the following funds for INSPIRE implementation:

2008: € 0.5 mln, 2009: € 0.7 mln, 2010: € 0.7 mln.

The above costs cover the implementation of the national, central facilities only.

The assumption in financing the costs of implementing INSPIRE for source data owners is that these costs are for the expense of the source data owners themselves (VROM, 2008).

Cost-recovery is the leading principle applicable to data supply by Dutch governmental bodies to third parties, and thus an important source of financing. A potential policy change in the Netherlands towards more open access to public geographic data thus poses a serious financing challenge. Some fear that other sources of financing maintenance will not be found, therefore reducing data quality and service provision.

The three main providers of geographic information are the Dutch Cadastre, the Topographic Service and the Statistical Bureau. The Dutch Cadastre is required by law to recover its operational costs through data sales, but is forbidden from making profits from its core activities. Both the Topographic and Statistical Agency receive core funding for their activities but are required to increase revenues from sale of data. . With the plans for the new PSI legislation, the new law will make a few explicit exceptions to the marginal cost policy. The Cadastre will be one of them.

Pricing

GEONOVUM, the Dutch metadata service, provides metadata free of charge. The data sets themselves are contained at the owning organization, being among others government agencies, provincial and local authorities.

Since the mid 80's cost recovery has been the leading principle applicable to data supply by Dutch government bodies to third parties. In the public sector a general tendency towards self-financing and thus cost-recovery has become evident (e.g. the Dutch Cadastre must be totally cost-recovering, the Topographic Service has to recover the costs for 50%). For 2007, the Dutch cadastre has announced a reduction in prices for some products, due to the good management of costs and the favourable market for real estate. A new price list was announced in January 2008, and entered into force during the first half of 2008 (http://www.kadaster.nl/pdf/Tarieven_kadaster_2008.pdf).

The memorandum "Towards Optimum Availability of Public Sector Information" by the Ministry of Interior Affairs (April 2000) sparked the discussion by promoting the availability of government information by stating that all government information should be disseminated at a maximum of the cost of dissemination. The Netherlands could thus be moving towards the open access policies of the United States.

However, in practice the lack of consistent national guidelines on pricing and/or availability of government information has resulted in pricing and access policies varying from one government department to another. Policy regarding trading information owned by the public sector was decided at Ministry level or even departmental level within a Ministry. Information was thus generally sold to citizens at cost (i.e. the cost of distribution, not the cost of collection). The price was much higher for resellers, sometimes four times the cost of distribution, with value-added information returning to the originating department at cost price. With the legislation on re-use of PSI, limits were set to the charges for spatial data of all the public authorities that fall under the application of the law. The Act is applicable to the Cadastre and other geographic data producers. When the planned amendments to the PSI legislation are passed, the policy of the 2000 Memorandum will be put into legislation, and a marginal cost pricing policy will be the general standard.

2.3.8 Conclusions of Component 2

The INSPIRE Directive has been transposed. In addition, an organisational and technological strategic framework has been established (GIDEON). The Government Information Public Access Act has been revised to include the implementation of Directive 2003/98 on the re-use of PSI. In 2009, the Ministry of Internal Affairs announced that it would review the legislation implementing the PSI directive. While the Dutch policy already went beyond the minimum requirements of the directive, this will be translated into the legislation. The new legislation on PSI will ban the public sector bodies from using their intellectual property rights to restrict the re-use of their data. Particular attention to privacy and personal data is also paid in the legislation on the authentic registration for buildings and addresses. Data from the registration that can be considered as personal data can only be transferred to parties that are authorised to process personal data under the privacy legislation. GEONOVUM, in cooperation with T.U.Delft, has started working on a licensing model based on creative commons, called *Geo gedeeld*. It proposes four sets of standard licensing conditions. It should be noted that no long-term financial security of the SDI-initiative exists. However, the Ministry of Housing, Spatial Planning and the Environment has reserved the following funds for INSPIRE implementation:
2008: € 0.5 mln, 2009: € 0.7 mln, 2010: € 0.7 mln.
Regarding the pricing framework the lack of consistent national guidelines on pricing and/or availability of government information has resulted in pricing and access policies varying from one government department to another.

Based on these conclusions we score the indicators as follows:

- There is a legal instrument or framework determining the SDI-strategy or –development

- There are true PPP's or other co-financing mechanisms between public and private sector bodies with respect to the development and operation of the SDI-related projects (Not so clear)

- There is a freedom of information (FOI) act which contains specific FOI legislation for the GI-sector (in Preparation)
- GI can specifically be protected by copyright (in Preparation)
- Privacy laws are actively being taken into account by the holders of GI
- There is a framework or policy for sharing GI between public institutions
- There are simplified and standardised licences for personal use (in Preparation)
- The long-term financial security of the SDI-initiative is secured (Partially)
- There is a pricing framework for trading, using and/or commercialising GI (in Preparation)

2.4 Component 3: Data for themes of the INSPIRE annexes

2.4.1 Scale and resolution: European, National, Regional, Local, Other

In the 'Structure Outline for Geo-information' (SVI, 1992) the information concerning parcels of land, people, companies, buildings and addresses, have been identified as the fundamental building blocks for the NGII. They are part of a larger concept within the e-Government initiative, called basic registers. Currently, the Dutch government has defined 13 basic registers of which 4 are spatial: building register (BGR); topography (BRT); addresses (BRA); cadastre (BRK). Further there is a personal register (GBA); a register for cars, one on salaries, etc. Other basic registers are in the pipeline: the GBKN and the register on the underground.

Parcels of land are available in the Automated Cadastral Register (AKR) for the alpha-numeric data on parcels, rights and owners and in the Land information and Cartographic Information system (LKI) for the geographical data. The fundamental geodataset for buildings has partially been developed in a tax-law for the assessment of real estate and will be further developed in the near future.

Two other nation wide fundamental geometric/topographic datasets are:

- Large Scale Base Map of the Netherlands (GBKN) (http://www.geodan.nl/nl/project/lsvgbknsite/);
- Top 10-Vector data set, a 1:10.000 core database made by the Topographic Service of the Netherlands (TDN – Topografische Dienst Nederland).

Examples of other available good, sophisticated fundamental datasets are the nation-wide:

- Land cover database of the Netherlands made by the DLO-Staring centrum (now Alterra);
- Land cover ecological database of the Netherlands made by the DLO-Staring centrum (now Alterra);
- Waterways geodataset made by the Survey Department of the Directorate General of Public Works and Water Management;
- Geology geodataset made by the National Geological Survey (NITG-TNO);
- Archaeology geodataset made by the Institute for Archaeological Soil Exploration;
- Cadastral map made by the Cadaster;
- Digital elevation model.

Besides these fundamental data sets hundreds of other core data and thematic data sets have been produced.

It is estimated that there are 36,000 datasets in the public sector of potential use to others. All scale levels are supported.

In the GIDEON report a table provides a list of 77 geodatabases in various scales with data owners such as Alterra, Kadaster, KNI, TNO etc.

2.4.2 Data by resolution or scale range for the INSPIRE themes

Regarding the three INSPIRE annexes addressing the 34 spatial data themes. The Netherlands is providing discovery and view services for most of them while a number of them can be also downloaded. The datasets are provided in a variety of scales and resolution according to their usage. All metadata are based on ISO and are available for most of the data themes.

GEONOVUM publishes an overview of progress in this area on its website. The progress review is confined to Appendix I & II. Through the list is understandable to everyone how far the various organizations involved have evolved. (http://www.GEONOVUM.nl/dossiers/inspire/voortgang).

A complete list will be presented in the updated report including the information provided by the country in 2010.

2.4.3 Geodetic reference systems and projections

The spatial reference systems used are:

- Rijksdriehoeksstelsel (RD) with the Bessel Ellipsoid of 1841 and a azimuth stereographic projection with ± 4000 higher order points;
- Lambert conformal conical;
- Geographic.

For GPS observations, ETRS is used.

2.4.4 Quality of the data

No information has been found nor provided about the data quality procedures for the GEONOVUM and other reference and core thematic datasets.

2.4.5 Interoperability

OpenGIS-standards are sometimes used to ensure interoperability between datasets and information services. GEONOVUM has released a document called Framework for standards (in Dutch) to guide the technical implementation of INSPIRE. The document consists of chapters on standards for INSPIRE and application to The Netherlands, metadata, architecture elements, information models and service elements.

As an important interoperability tool, a national validation service for the spatial planning standards was developed (Ministerie van VROM, 2009), which became operational by the end of 2008. A national validation service was provided to test digital plans at four levels. The first test ensures that the GML data encoding is according to the schemes and

business rules of the standards. The second test sees whether all file names are used properly. A third test determines whether the geometry is fully interoperable, not only according to official GML-standards but also with specific choices to facilitate the use in a broad range of GIS and CAD systems. Finally, a check is made to see if the digital signature is valid to ensure the integrity and completeness of the plan (Duindam et al., 2009).

In the webpage of GEONOVUM users can find this validation tools (http://www.GEONOVUM.nl/diensten/valideren).

2.4.6 Language and culture

Metadata and documents are provided in Dutch. The websites of the different authorities are in Dutch and often also in English. The geoportal is in four languages: Dutch, English, French and German.

2.4.7 Data Content

No information has been found nor provided.

2.4.8 Geographical names

Geographical names are managed in Dutch.

2.4.9 Character sets

No information has been found nor provided.

2.4.10 Conclusions of Component 3

Already from the previous NL's SoP report Geodatasets existed which provide a basis for contributing to the coverage of pan-Europe for the INSPIRE-selected data themes and components while the geodetic reference system and projection systems are standardised, documented and interconvertable. As an important interoperability tool, a national validation service for the spatial planning standards was developed. Metadata and documents are provided in Dutch while the websites of the different authorities are in Dutch and often also in English.

Based on these conclusions we score the indicators as follows:

- Geodatasets exist which provide a basis for contributing to the coverage of pan-Europe for the INSPIRE-selected data themes and components
- The geodetic reference system and projection systems are standardised, documented and interconvertable

- There is a documented data quality control procedure applied at the level of the SDI (Partially)
- Concern for interoperability goes beyond conversion between different data formats
- The national language is the operational language of the SDI
- English is used as secondary language

2.5 Component 4: Metadata

2.5.1 Availability

Metadata are produced for a significant part of the geodatasets. GEONOVUM has the coordinating and stimulating role. The National Georegister (NGR) brings geographic information from Dutch authorities together in an integrated portal.

2.5.2 Metadata catalogues availability + standard

GEONOVUM manages the metadata catalogue in a centralized way. GEONOVUM introduced the Dutch ISO 19115 metadata profile which is based on:

ISO 19115:

·EN ISO 19115*:2005, Geographic information - Metadata2*

·ISO 19115/Cor.1*:2006, Geographic information – Metadata, Technical Corrigendum 1*

ISO/TS 19139:2007, *Geographic information - Metadata – XML Schema Implementation*

CSW 2.0.2, *OpenGIS® Catalogue Services Specification 2.0.2, OGC, 2006*

CSW2 AP ISO, *OpenGIS Catalogue Services Specification 2.0.2 - ISO Metadata Application Profile*, Version 1.0.0, OGC 07-045, 2007

ISO 19108:

·EN ISO 19108*:2005, Geographic information – Temporal Schema3*

ISO 8601, *Data elements and interchange formats - Information interchange - Representation of dates and times*

ISO 10646-1, *Information technology — Universal Multiple-Octet Coded Character Set (UCS) — Part 1: Architecture and Basic Multilingual Plane*

ISO 639-2, *Codes for the representation of names of languages - Part 2: Alpha-3 code*

ISO TC 46/SC 4, *2003*, *Dublin Core Metadata Element Set, versie 1.1*, also published as ISO 15836:2003, http://www.niso.org/international/SC4/n515.pdf.

(http://www.GEONOVUM.nl/sites/default/files/standaarden/NLmetadataprofielISO19115v12maart.pdf)

The National Georegister (NGR) brings geographic information from Dutch authorities together in an integrated portal. Metadata can be found for a number of different themes on the national geoportal from 2008 onwards, while the total number of datasets in the National Georegistry is constantly updated and on April 2010 were 884. Users can search for metadata using keywords such as area, theme and/or producer of the dataset.

2.5.3 Dublin core metadata standards for GI-discovery

The Dublin core metadata standards are not applied.

2.5.4 Metadata implementation

No information has been found nor provided.

2.5.5 Conclusions of Component 4

Metadata are produced for a significant fraction of geodatasets of the themes of the INSPIRE. The National Georegister (NGR) brings geographic information from Dutch authorities together in an integrated portal. Metadata can be found for a number of different themes on the national geoportal from 2008 onwards. GEONOVUM manages the metadata catalogue in a centralized way. However, GEONOVUM provides models and brings people together, but does not coordinate implementation.

Based on these conclusions we score the indicators as follows:

- Metadata are produced for a significant fraction of geodatasets of the themes of the INSPIRE annexes
- One or more standardised metadata catalogues are available covering more than one data producing agency
- There is a coordinating authority for metadata implementation at the level of the SDI (No)

2.6 Component 5: Network Services

The Netherlands counts numerous web mapping services. This list is just an overview of services made publicly available via the preliminary geo-portal of GEONOVUM: http://services.GEONOVUM.nl/PAS.php, as well as the national geoportal http://www.nationaalgeoregister.nl/geonetwork/srv/en/main.home.

Their also a specific INSPIRE search that allows to search per Annex, Source type, Service type, Organisation and INSPIRE theme.

2.6.1 On-line access service for metadata: discovery services

Metadata were consulted free of charge through the NCGI on http://www.ncgi.nl/ncgi/. The foundation NCGI was planning for making other (thematic, enterprise) metadata catalogues available through one geo-portal. This has been achieved through http://www.nationaalgeoregister.nl/geonetwork/srv/en/main.home. In the Geoportal a metadata search result in 970 different results from a variety of sources. Moreover, GeoNetwork open source provides the option to save these results as pdf.

The National Georegistry provides:

- a geographic search engine
- a web mapping viewer
- publishing tools for data providers
- elaborate background information

For example metadata from Rijkwaterrstaat Waterdienst (http://www.nodc.nl) are in English, their character is utf8 and are ISO 19115:2003/19139 version 1.0 (US Federal Geographic Data Committee (FGDC).

Another map service is the national Atlas (http://www.nationaleatlas.nl/) which is on its 3rd version. The project was co-financed by the Program 'Ruimte voor Geoinformatie' (project RGI-111). All maps of the Atlas are interactive and allow for the display of the data behind the symbols. It is also possible to search the SDI for alternative datasets. Through the atlas maps, which will display the footprint of the available datasets, the metadata of those datasets can be evaluated. The envisaged architecture of the national atlas in the national spatial data infrastructure will be employing the OWS specifications in a multi-tier setup (Kraak et al., 2009).

2.6.2 On-line access service for data: download data

GEONOVUM is planning for such services.

2.6.3 Inter-linkages of on-line access services for metadata data

These are planned by GEONOVUM

2.6.4 OpenSource software for access services

There is a tendency in the GEONOVUM to turn to this type of software-solutions. The program OSOSS tries to stimulate this (see https://noiv.nl/open-source-en-open-standaarden/).

The current spatial planning standards are largely based on comprehensive GML3 schema with GML profiling on top of that to overcome interoperability issues. Web service access to this data requires the use of web based feature services (WFS) (Duindam et al., 2009).

2.6.5 Availability of viewing services

The metadata access service on http://www.nationaalgeoregister.nl/geonetwork/srv/en/main.home has a graphical component, enabling a visual appreciation of the geodataset, as well as an elaborate search option. A number of organisations (governmental, provinces, municipalities, water boards, private companies etc) are currently involved in the integrated portal.

Within the RGI framework, several portals and services are being developed (see also http://www.geoloketten.nl). Also Google earth and –maps are becoming more popular as basis for viewer developments.

2.6.6 Availability of catalogue services to regulate access

These types of services are envisaged for the GEONOVUM.

2.6.7 Availability of catalogue services that perform payment operations

These types of services are envisaged for the GEONOVUM.

2.6.8 Availability of catalogue services to extract and send data to a user application

These types of services are envisaged for the GEONOVUM.

2.6.9 SDI user applications

Partly under the umbrella of the R&D initiative (‘Space for Geo-Information initiative’), GEONOVUM is developing and testing a vision on an advanced service of interconnected regional and thematic geoportals and web-based geo-services (see 2.6.5).

2.6.10 Availability of geo-processing services

See Section 2.6.9.

2.6.11 Conclusions of Component 5

The Monitoring report confirms that there is one discovery and 48 viewing services, while 36 download services were reported. No information was found regarding transformation and middleware services allowing data services to be invoked.

Based on these conclusions we score the indicators as follows:

- There are one or more discovery services making it possible to search for data and services through metadata
- There are one or more view services available for to visualise data from the themes of the INSPIRE annexes
- There are one ore more on-line download services enabling (parts of) copies of datasets
- There are one or more transformation services enabling spatial datasets to be transformed to achieve interoperability (Not Known)
- There are one or more middleware services allowing data services to be invoked (Not Known)

2.7 Component 6: Thematic environmental data

The national geoportal (http://www.nationaalgeoregister.nl/geonetwork/srv/nl/main.home) provides a list of various thematic environmental data. This list (part of the search option) includes themes such as: agriculture and livestock, biota, climatology, meteorology, inlands waters, oceans, etc.

2.7.1 Conclusions of Component 6

Based on the information provided on the previous paragraph we score the indicator as follows:

- Thematic environmental data are covered by the described SDI-initiative or there is an independent thematic environmental SDI (Partially)

2.8 Standards

The standardization process that has taken place in the field of spatial planning in the Netherlands over the last years has yielded a coherent set of Spatial Planning Standards.

The Standards comprise three normative parts:

An information model (GEONOVUM, 2008), standards comprising comparability requirements and a standard for the infrastructural demands (Ministerie van VROM, 2008).

The use of the Standards by municipalities, provinces and the central government itself is enforced by law in a separate governmental Regulation. In these terms, the standards are appendices to this regulation. This means that updates will be made in a controlled and transparent process. For the future, it is envisioned that updates on the Standards will be made in a rhythm of every two years to accommodate errors and future developments. For this reason, the management and maintenance of the Standards is granted to GEONOVUM. This management is executed in close relation to the main spatial planning stakeholders as a transparent process, ensuring future commitment. (Duindam et al., 2009)

Moreover, in the website of GEONOVUM there is a dedicated page on Geo-Standards and especially on INSPIRE compliant geostandards (only in Dutch). (available at: http://www.GEONOVUM.nl/geostandaarden). At the same time a wiki-page on standards exists (http://wiki.GEONOVUM.nl/index.php/Main_Page) providing the standards framework. The framework includes information about International, European and Netherlands standards. Moreover, information on metadata and Service Oriented Architecture is provided.

The coherence in the framework is based on the division in three parts, metadata, information models and network services. In the three parts the standards are categorized to obtain a good connection to existing (inter)national standards, including INSPIRE standards. The following table shows how this is elaborated and it also gives an overview of what is described by the framework.

	Used in The Netherlands	Based on...
Metadata	Dutch metadata standard for geography Dutch metadata standard for services	Related standards from the ISO 1900 series, OGC and W3C standards. Connection with the INSPIRE set, Advise overhead (a Dutch program of the Ministry of internal affairs), user needs, etc.
Information models	NEN3610-Base model geo-information as a generic semantic model Derived form NEN3610 information models for Spatial planning (IMRO), Water (IMWA), Topography scale 1:10.000 (TOP10NL) and large scale (IMGeo), Cultural inheritance (IMKiCH), Cables and pipes (IMKL), Soil (IMBOD), and so on.	Related standards from the ISO 1900 series, OGC and W3C standards. The information models for the domains are made through harmonization by representatives in the domains
Network services	Profiles for WMS, WMS-SLD and WFS (work on this is in progress). International standards	Related standards from the ISO 1900 series, OGC and W3C standards. Set up is based on principles of Services oriented Architectures (SOA)

(table on standards used in Netherlands, taken from Bulens et al., 2007).

2.8.1 Conclusions of Component 7

Developments of international standards are followed closely and applied. Moreover, a strategic document from GEONOVUM: “Geo-standaarden” exists.

Based on these conclusions we score the indicator as follows:

- The SDI-initiative is devoting significant attention to standardisation issues

2.9 Use and efficiency of the NSDI

Examples of the positive impact of the use of (parts of) the infrastructure and how the SDI is used to support environmental practices:

In the Netherlands, different ministries and some national geo-information registers, generate a National Geo Data Infrastructure for Disaster and Crisis management: GDI R&C (2009). This GDI is available via *we*b service through a dedicated infrastructure

especially for crisis and disaster management: OOV-net and is owned by the ministry of Internal Affairs (Smit, 2009).

Another part of the Dutch SDI is developed in the project EduGIS, in which geo-information and GIS tools from different sources are made available for educational purposes. The aim is to stimulate GIS use in schools so students learn spatial thinking and using geo-ICT and become more aware of their (spatial) environment. See: www.edugis.nl.

An important element -from the perspective of the future development of an SDI at the European level- is that initiatives have been taken to develop cross-border SDI projects. An example is the cross-border exchange of information between the Netherlands and North Rhine/Westphalia. The ministry of Housing, Spatial Planning and the Environment is responsible for an Interregional European cross border management which in turn is part of the GIDEON policy plan. The intention is to establish collaboration among Dutch, German and Belgian borders including 4 Euro regions in one common program X-border-GDI. A number of running examples include spatial planning, Water management, Nature and Tourism, Traffic and Disaster management (e.g. the Geo viewer for animal disease, the Tourism project 'eRIGG' providing hiking maps, etc). Details of the project can be found at: http://www.x-border-gdi.org/en/index.html.

Moreover, a research network led by NEO BV on change detection has been established (http://www.mutmut.nl/index2.html). The projects of Mutatis Mutandis indicate the spatial changes of geoinformation.

3 Annexes

3.1 List of SDI addresses / contacts for The Netherlands

Table: SDI contact list			
	Web address	Organisational mailing address	Over-all contact person: tel./fax/e-mail
National			
GEONOVUM	http://www.GEONOVUM.nl/	Barchman Wuytierslaan 10 3818 LH Amersfoort,	E-mail: ro-standaarden@GEONOVUM.nl Tel: +33 460 41 00 Fax: +33 2465 64 5 **Bastiaan van Loenen** E-mail: b.vanloenen@geo.tudelft.nl
Kadaster	http://www.kadaster.nl/index.html	Postbus 9046, 7300 GH Apeldoorn.t	Prof. Bas Kok bas.kok@kadaster.nl Peter Laarakker Peter.Laarakker@kadaster.nl
MinVROM	http://www.vrom.nl/pagina.html?id=1	Rijnstraat 8; Postbus 20951; 2500 EZ Den Haag; Internal postcode 150	Mr. Noud Hooyman noud.hooyman@minvrom.nl and Mr. Rob Kragt

3.2 List of references for The Netherlands

Table: list of references used to compile the Country Report	
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