

Partnership Building is a Crucial Element of the Dutch NSDI

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Key words: NSDI, organization and cooperation.

SUMMARY

New initiatives have been taken, which stimulate partnership building around the Dutch NSDI (National Geo Information Infrastructure: NGII). In my paper, I have summarized the basic elements of the organizational context for assessing the maturity of SDI's and the assessment of the maturity of the Dutch NSDI in particular.

From the organizational perspective, I concluded that the Dutch GI community plays an important role in the realization of the NSDI. The GI community is in the stage of active helping and solving the identified problems, and actively working on innovations in cooperation with the responsible government authorities.

My conclusion is illustrated with the description of three cases of partnership building in the Netherlands. These cases play an eminent role in the realization of the Dutch NSDI.

The first case handles on the open relationship between the partnership of the Large Scale Basis Map (GBKN) and the responsible Minister of Housing, Building, Spatial Planning and Environment. (Coordinating Minister of GI). The partnership has the ambition that GBKN will be qualified as authentic register (main registration in the Dutch Government policy) in the future. Financial issues are of vital importance in the negotiation process, but the partnership and the Dutch authorities are willing to find the right solutions.

The second case illustrates the stage of the current maturity of our NSDI, and the way in which central government organizes partnership building in the digital national spatial planning process. These plans should be digitized and exchanged between municipalities, Provinces and central government authorities. A partnership has been formed consisting of members from the Ministries of Spatial Planning, Interior, Municipalities, the Provinces, the Water Boards, Nirov, the BNSP and the Ravi. The partnership stimulates the public authorities to produce spatial plans in a digitized form. The Ministry of Spatial Planning is making use of the standardization approach, which has been developed by the Ravi partners during the last ten years. New legislation for spatial planning is in preparation and the authentic registrations, as a part of the Dutch NSDI and the Dutch e-government program, will be related to the new digitized spatial planning documents and maps.

The third case illustrates the way in which the geo information sector works actively on innovation. The Dutch Government provided Ravi a subsidy of € 20 million for the innovation of the Dutch NSDI. The program consists of seven sub programs, such as societal issues, infrastructure nodes, access, dissemination, science and research, product innovation and knowledge.

An overview is given that shows how partnership building for the innovation process of the NSDI is being organized, what the results are, and how these partnerships stimulate the innovation process of the Dutch NSDI. At this moment, around fifteen consortia consisting of eighty partners are active in this innovation process of the Dutch NSDI.

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1. INTRODUCTION

SDI's facilitate the collection, maintenance, dissemination, and the use of spatial information. The NSDI in the Netherlands is one of the most advanced in the world. This was one of the conclusions in the article of Bastiaan van Loenen and myself, which handles on assessing the maturity of NSDI's (see Kok & Van Loenen). We worked out indicators, key conditions and crucial aspects from an organizational perspective for the development of these infrastructures. These aspects are the existence of a leadership, a vision, coherence and the intention of the geo information sector to initiate new innovations. Leadership is a critical issue. A NSDI needs continuous support, both from managerial as from political level. In the ideal situation an independent vision should be created and supported by all the main stakeholders in the process of development of infrastructures. Open communication channels need to be strived for. The ability to self-organization is the ability of the community for the initiation, cooperation and innovation of activities.

B. Kok, B. van Loenen / Comp., Environ. and Urban Systems xxx (2004) xxx-xxx

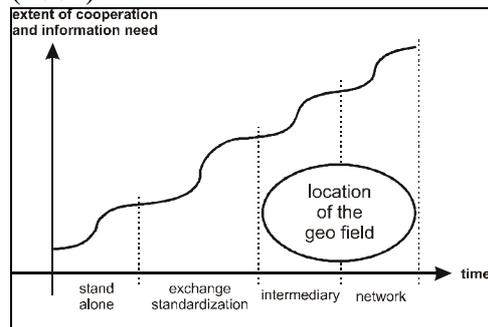


Figure 1: Conceptual view on development of NSDI

The partnership building is an important element in this category. We distinguished for the development of NSDI's the stand-alone stage, the exchange stage, the intermediary stage and the network stage. In the stand-alone stage the SDI is not a priority of the international organizations. In the exchange stage the stakeholders are being active in the development of a vision of the NSDI. During the intermediary stage in the process there is an increasing awareness for cooperation between the stakeholders. In the network stage a broad commitment exists for the NSDI vision and this vision is being continuously reviewed in an open communication process.

Stage Aspect	Stand alone	Exchange	Intermediary	Network
<i>Vision</i>	Focus on individual organization	Developed with all stakeholders	Implementation	Commonly shared, and frequently reviewed
Leadership	Focus on individual organization	Questioned	Accepted	Respected by all stakeholders
Communication	Focus on individual organization	Open between public parties	Open between all stakeholders	Open and interactive between all
Self-organizing ability	Passive problem recognition	Neutral problem recognition	Actively helping to solve identified problems	Actively working on innovation

Table 1: Maturity of Dutch NSDI from an organizational perspective

In this scheme the basic elements of the organizational context for assessing the maturity of SDI's has been summarized. In the intermediary stage the commitment of implementation of the vision is created, the leadership is accepted, the communication between the stakeholders is well organized and the community is active in helping to solve the identified problems. In the network stage the vision will be commonly shared and respected by all the stakeholders in an open interactive communication process and active working on innovation. We came in our article to the conclusion that in the Dutch NSDI the vision had been defined in the structure plan for land information and further developed in cooperation with all the stakeholders and had been implemented during the past years. The Minister of Housing Spatial Planning, and Environment is responsible for the coordination of GI in the Netherlands. On the one hand the leadership is accepted, because of the large support of the Geo Information sector in the Electronic Government Program for the creation of Authentic Registrations. Public sector organizations are obliged to use these registrations. In the current situation seven geo registrations are being identified as so called authentic registrations. On the other hand the leadership is questioned because of the tensions between the autonomous public GI organizations for the development of a own prizing policy and the access policy of central government which tends to an access policy providing public data to citizens and private companies for free. The partnership building is well developed. The GI sector is actively working on innovation and is actively working in partnerships during the implementation process of our vision. In this paper I will illustrate this successful partnership building with three cases.

The first case handles on the production of the Large Scale Basic Map as one of the building blocks of our National Geo Information Infrastructure and a candidate being a potential Authentic Registration. This digital registration has been produced in the Netherlands nation wide by a Public Private Partnership consisting of the Dutch Cadastre, the joint Utility

companies, Dutch Telecom and the Association of Municipalities. The second case is the partnership building for the creation of digital spatial plans on municipal, regional and national level and the ability to exchange these plans between the main authorities and the organization of the digitalization process of spatial plans.

The Dutch Ministries of Spatial Planning and Interior, the Association of Municipalities, the joint Provinces, the joint Water Boards and the Ravi, have carried out this digitized spatial planning process in the Netherlands. The third case is the partnership building in the Dutch Space for Geo Information Program. A Call for proposals of the Minister of Industry and Economic Development for innovative knowledge projects accomplished by consortia of public, private and academic organizations stimulated the community to work the Tender proposal “Space for Geo Information” (Ravi 2003). On November 28th 2003 the Dutch government provided a € 20 million subsidy for promoting the innovation of the Dutch NSDI. This Program Space for Geo Information is in the execution stage now. The Ravi has set up a separate foundation. This foundation is responsible for assessment and selection of the project proposals of a huge variety of different partnerships, which will lead to the right innovation. A short overview will be given which partnerships are successfully working on the innovation process of the Dutch NSDI.

2. FIRST PARTNERSHIP CASE: Digital Large Scale Basic Map (GBKN)

In this case I will show on how a broad composed public private partnership in the Netherlands has taken the initiative for the production of the Dutch Large Scale Basic Map on scale 1:1000/ 1:2000 (GBKN). This GBKN was a part of the Structure Plan for Land Information. The Map has been produced nationwide.

Present Organizational Model

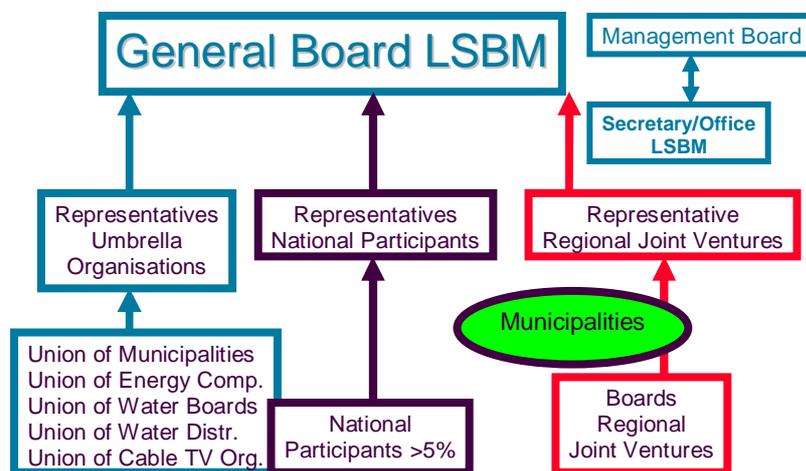


Figure 2: organizational Model of GBKN

The consortium consists of public organizations such as the Dutch Cadastre, the Association of Municipalities and private organizations such as the joint Utility Companies and the Dutch

Telecom. The production costs amounted approximately € 250 million. The maintenance costs are € 21 million a year.

The joint producers currently own this digital map. In 1998 a new e-Government policy has been launched. One of the basic elements of this policy is the creation and maintenance of so called authentic registrations. These registrations are the backbone of the current e-Government program.

Authentic registers are essential for the exchange of information within the public domain. The registrations are obliged to be used by the public sector authorities. The data need to be collected once and must be stored at one authentic place. High quality data requirements should be formulated and separate laws must regulate the registrations. The regulation should include the data security issue, the availability of data and access, the responsibility and the arbitration.

The implicit impact of the obliged use of authentic registrations could be, that central government institutions paying the costs of the design, implementation and use of the authentic registrations. It is curious that this condition isn't formulated in the government decision for the obliged use of authentic registrations. However, the Committee for the investigation of costs for Authentic Registration concluded in 2001 that users are not being obliged to pay huge prices for the data and central government takes charge of this.

In June 2004 the Government took the decision that six geo registrations as a part of the structure plan for land information are qualified being authentic registrations. These registrations are the basic elements for improving public services to citizens and private companies, for lowering fraud and for increasing public safety.

These registrations are the Register of Enterprises, the Population Register, the Digital Small Scale Basic Map 1: 10.000, the Registration for Addresses and the Registration of Buildings, and the Cadastral Registration. A parallel legislation process is in preparation for the implementation of these authentic registrations in the public domain. The implementation of these regulations must be finalized in 2009 ultimately.

The Dutch government in June 2004 is qualifying other potential authentic registrations. Candidates for the authentic registers are the registration of license plate numbers of cars, an insurance policy registration, the registration of the income, registration of immigrants and the registration of the GBKN.

The central government is likely using this last map in the future for public order and safety and digital spatial planning processes.

On January 18th 2005 the Public Private Partnership joined in the Foundation of the GBKN has set up an Action plan which steps need to be taken for negotiation with the government how to come Authentic Registration Status of the GBKN.

The Public Private partnership has defined the bottlenecks, such as organizational issues, financing, standardization and harmonization and pricing.

Over 2003 the yearly exploitation costs amounted € 21 million. The division of these costs are for 30% the joint Dutch municipalities, 20% for the Dutch Cadastre and 50 % for the joint utility companies and the Dutch Telecom. If necessary the departments of Interior and the Department of Spatial Planning, the Water boards and the Provinces are each paying 4%.

The private companies are paying 40% of the costs and the public partners 60%. The GBKN is owned by the entire public private partnership. So the users (not being investors) have to pay high prices for the products.

Since April 2003 it is possible the buy products via Internet.

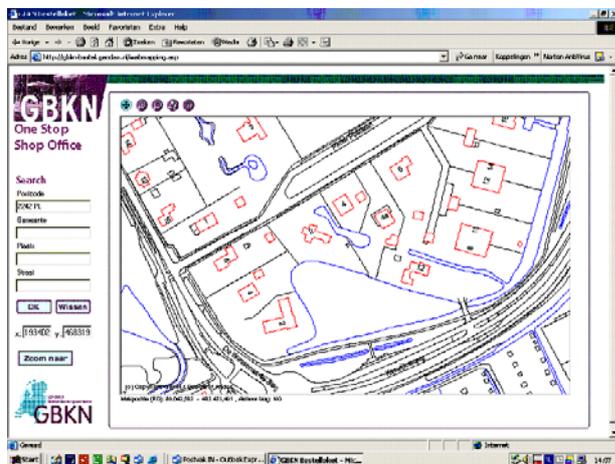


Figure 3: screen of One Stop Shop Office (LSV GBKN)

This gives an additional income for the partnership of € 400.000, = a year. It's also possible to make use of the GBKN viewer via Internet. Views have to be paid from 1000 views for € 1000 till 500.000 views for € 100.000,= and on unlimited base for € 150.000,=.

Another bottleneck is the strategy of central government up till now. The main Dutch GI producers joined in the public private partnership took the initiative for the production of the Large Scale Basic Map. The Dutch government didn't pay for production. The central government institutions hardly made use of the products of the GBKN.

In this new action plan of the public private partnership of the GBKN an interesting process is starting on.

'The foundation worked out some scenarios, which steps need to be taken before the Large Scale Basic Map can be qualified as Authentic Registration. Before this decision can be taken decisions are needed regarding responsibility, control, division of tasks and organizational structure. In that case the Ministry of Housing and Building should have responsibility and

control. The production will be organized in a separate way. Another scenario could be the responsibility will be located on the level of the public private partnership. In both options a new pricing mechanism need to be set up. In this GBKN case important financial bottlenecks must be solved before the decision making on the qualification being an authentic registration can be taken. For that reason the partners and the Ministry of Housing and Building are identifying the main bottlenecks. The first option for solving this problem is a total financial compensation of the ownership of the GBKN paid by the central government. The second option is partnership of central government in the ownership of GBKN.

The public private partnership of GBKN and the Ministry of Housing and Building are willing to start with a common project to work out these financial bottlenecks in a more detailed way and formulating proposals to over bridge these problems when this registration must be used in the e government program.

Remarkable for the stage of development of our NSDI is the willingness of the partners to solve this problem in interaction with the responsible authorities.

3. SECOND PARTNERSHIPS CASE

3.1 Digital Spatial Plans in the Entire Public Administration DURP

The Minister of Spatial Planning took the initiative, in cooperation with the joint municipalities, Provinces, the Dutch Water Boards to strive for a better enforcement of the spatial planning policy in the Netherlands. More updated spatial plans at all the administrative levels are needed in the future. For doing this in an effective way digital spatial plans of the Dutch public authorities need to be set up.

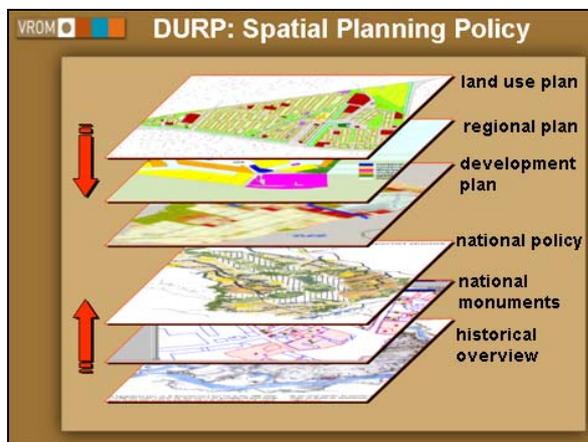


Figure 4: DURP: Spatial Planning Policy

These plans should be digitized and exchanged between municipalities, Provinces and central government authorities, getting approved on several administrative levels. A partnership has been formed consisting of the Ministries of Spatial Planning, Interior, municipalities, the

Provinces, the Water Boards, Nirov, the BNSP and Ravi. This partnership stimulates the public authorities to produce the spatial plans in a digitized form. The ambition of the Dutch government is full availability of the entire municipal, provincial and central government spatial plans in digital form ultimately at the end of 2017. Regulation is in preparation now to fulfill this task. The expectation is this legislation will come into force in the year of 2007. The new regulation addresses an acceleration of the spatial planning process for getting quicker approval of the plans, building permits etc, and an increasing communication with citizens and private companies in an interactive and digital way. New standards are needed and new portals need to be set up. Citizens are in the future in the opportunity to combine the image of the spatial plan, with aero photographs, and the future authentic registrations (objects of the small scale basic map, with buildings, the cadastral registration and the registration of enterprises).

This is a very interesting partnership building initiative, because this partnership is based on the results of our vision defined in the structure plan for land information and worked out in the authentic registration approach. Separate standards for the spatial planning process are being developed but these standards are related with the general basic model for standards, which had been defined with the main stakeholders during the last ten years.

In the current situation 90% of the Dutch municipalities have the intention to work with digital spatial plans; all the twelve Dutch Provinces are actively working with this new partnership DURP approach and the recent central spatial government plan “Ruimte” is available in a digitized form, with a possibility being exchanged between all the government levels.

The partnership is working on the development and maintenance of standards, the development of a national spatial geo portal, an action plan for the implementation of the relation between authentic registrations and digitized spatial plans, and the participation in pilot projects in the administration for the innovation of the spatial planning process.

In the standardization area the public sector participants in Ravi are developing common standards since more than ten years. In the beginning of the nineties all the Dutch public sector organizations developed commonly a general basic model for geo information. The model consists of semantic standards. This model is relevant for all the stakeholders such as for definitions of buildings, and for other terrain elements, combined with characteristics and relevant object relations. This modeling is an un going process and will be executed according to the UML approach. Ravi is working in cooperation with their partners on making these general basic model standards compatible for GML exchange in cooperation with private companies in accordance to the Open Geo Spatial Consortium (OGC) based on the ISO philosophy. Closely related to the general basic model sectoral standards are developed for the water sector, for the national small-scale basic map and for the national spatial plan in the DURP project the IMRO standard. The DURP partnership is responsible for the definition, implementation and maintenance of these IMRO standards. In this way the IMRO standard is the bridge between digital land use plans between the local, provincial and central government authorities.

In preparation is the design of a national portal for spatial plans. An inventory will be made of the users and an organizational scan will be done how the five hundred municipalities, the twelve Provinces and the five Ministries can optimize the availability of these data in the spatial plans and how the citizens and private companies can have optimal access to these data e.g. getting permission for building activities, or for public participation purposes. In this project an inventory will be made, which other authentic registrations from our NSDI can be combined with the spatial planning data and can be provided to citizens and private companies via the Web.

Standards, and definitions in relationship with digital spatial plans, need to be worked out in a more detailed way.

For this reason pilot projects are initiated for facing the following problems:

- The quality requirements of spatial plans and additional official additions in the plan. In that case an official digital signature is needed. The question is how this works in this process?
- What are the requirements for public participation in digital plans and how will the reaction be communicated to the authorities on different levels and the persons concerned?
- How must a request on getting building permission in a digital way being checked with the digital municipal spatial plans in the back office?
- How do the digital checking activities during from the preparatory phase to the authorization of the plan being organized?
- How can the plan be monitored in an active way in cooperation between the central government authorities and the Provinces?

An initiative has been taken to start with a first pilot project in the province of Flevoland. This project is focused on the innovation of the spatial planning process in the preparatory phase. In this new legislation for spatial planning of 2007, consultation between authorities and citizens will play a more important role than in the past. Consultation will be an obligatory instrument between the municipality and Provinces and between the Ministries of Housing and Building, environment and public roads and waterworks. The developed IMRO standards by Ravi in the DURP partnership are tested in this pilot project.

This example of partnership plays a crucial role for the development of the new digital spatial planning procedure in the Netherlands and the Dutch NSDI is a vital instrument for the realization of this ambitious target.

4. THIRD PARTNERSHIPS CASE: The Space for Geo Information Program

On November 28th 2003 the Dutch Government took the decision to provide the Netherlands Council for Geo Information (Ravi) a subsidy of € 20 million for the innovation of the Netherlands Geo Information Infrastructure (NSDI) in the project “Space for Geo Information”. The NSDI consists of data, standards, technology and organizational issues. A broad consortium of over hundred twenty partners from public sector, private sector, universities and research communities have organized a financial commitment of € 27

million, which backs the project. The turnover of the project amounts approximately € 40 million. The Dutch and also the international partners will be invited in the coming six years to bring in proposals prepared by consortia from public sector organizations, private companies, research institutes and universities to stimulate the innovation of the NSDI and the Dutch knowledge economy, and the proposals if submitted and accepted, will be financed by 50% by the Dutch government.

In the year 2000 the Ravi took the initiative to prepare a project proposal Space for Geo Information.

The main goal of the Space for Geo Information program is: “The enhancement and innovation of the geo information infrastructure and the geo knowledge community in the Netherlands towards a sound and efficient public administration and a robust business”

The Space for Geo Information program which had been prepared by a Ravi steering committee consisted of representatives of the Wageningen University, Alterra, Research Institute TNO Delft, the Ministry of Public Road and Waterworks, the Dutch Cadastre and the Ravi Director.

The program is subdivided in the following subprograms.

- Social issues (sub program 1). This program is focused on the relationship between societal issues and geo information.
 - How can spatial planning and integrated policy take into account multifunctional use of space?
 - How can safety be enhanced?
 - How can multifunctional uses of rural areas being stimulated?
 - How can the mobility in the Netherlands be improved and traffic congestion being tackled?
 - How can the public administration inform citizens and companies clearly and how can the interaction with citizens being improved?
- The NSDI (sub programs 2 and 3) is currently insufficient for providing the right information to citizens for services, participative democracy and stimulating social coherence in neighborhoods. Public data need to be integrated. New techniques and organizational agreements are necessary. This program is especially focused on the creation of local and regional infrastructures. The challenge is to link these initiatives in the different sectors with national activities.
- Program 4 stimulates the improvement on access of public information, by the development of new products, data integration, new applications and new portal tools.
- Fundamental and strategic research (sub program 5) stimulates the national research and knowledge basis.
- Company and product innovations are strengthening the international position of the Dutch geomatics- sector
- The sub program knowledge development stimulates learning by doing and interaction between administrators, researchers, scientists and GI professionals.

The program proposal of the Ravi Steering Committee has been sent in to the government in March 2002. The Government invited Ravi to work out this project proposal on March 25th 2002. During this year the Ravi Steering Committee organized two meetings with all the public organizations, private companies, universities and research institutes in the geo information sector getting support of the plan. Before the organization of these meetings commitment had been organized with the main stakeholders of the subprograms. These meetings had been organized in summer 2002.

On February 14th 2003 the Ministry of Economic Affairs had submitted the definitive project proposal for the Space for Geo Information Program. The Dutch Royal Academy of Science and the National Economic Institute had assessed the proposal in 2003.

After the positive decision of the Dutch Government on November 28th 2003 the Ravi has set up an organizational structure for the execution of the program. On September 14th 2004 a foundation had been set up, which is responsible for the execution of the Space for Geo Information program.

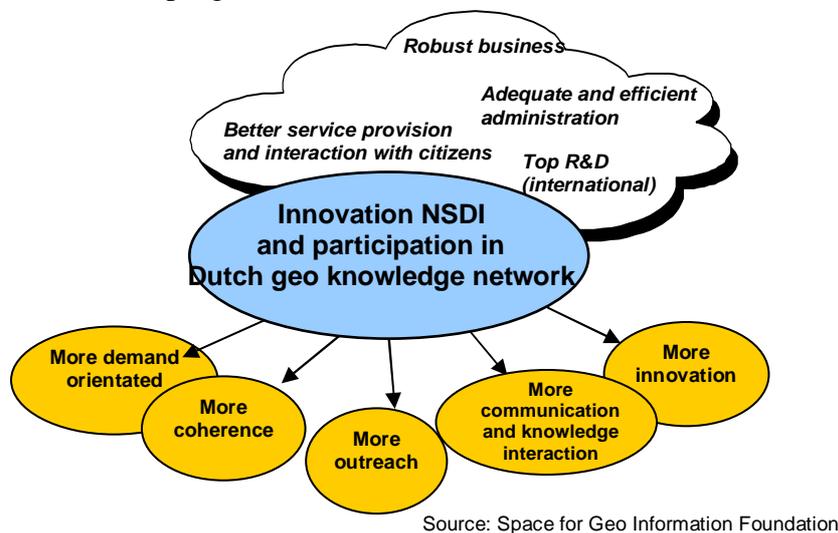


Figure 5: Strategic framework Space for Geo Information

The execution of the program is a large success so far. The first tender procedure has been started in the September 2004

The following consortium proposals were sent in and had been selected by the Space for Geo Information Foundation:

- Geographic dimensions of Risk Management focusing on a risk map as
- interactive communication instrument between public administration and citizens.
- Using different GI layers related to the integrated use of spatial plan to citizens and decision makers.
- Virtual Holland
- Geo farming
- Development of assessment frameworks of NSDI's
- Uncertainties in the spatial planning process

- Cross border SDI for water management between the Netherlands and Nord Rhein Westphalia
- 3D Topography

A first observation is the huge amount of money which consortium partners have generated up till now. The consortium partners have generated € 13 million totally of the € 7 million, which was available for the first part of this first tender. This illustrates the enormous interest of the geo partners in starting innovative initiatives.

The second part of the tender has been started in the end of this year. These proposals should be focused on the building blocks, basic elements and the main framework of the program. Decision making after the assessment and reviewing procedures has been taken recently.

A second observation is the quality of the consortia. In almost every consortium private companies are well represented. In other innovation programs of the Dutch government the average percentage of private sector representation amounts round 15%. In the Space for Geo Information Program the participation of private sector companies is 25 to 30%, twice as much as the average figures. In the years 2004 and 2005 40% of the subsidy will be spend. In the years 2006, 2007 and 2008 this percentage will be respectively 30, 20 and 10%.

A third observation is the ideal mix of consortium partnership building. Every consortium consists mainly of a geo information producer, a research institute, an university and a private company. A fourth observation is the way in which knowledge and communication will be organized. In 2005 a communication conference will be organized on how the results of the ongoing projects are being implemented in the knowledge infrastructure and how the knowledge will flow. In 2005 a knowledge agenda will be set up what the priorities are in the coming year. Expected priorities for the second tendering procedure in the end of 2005 are the stimulus for having more demand-oriented proposals on board. A fifth observation is the relatively minor international participation in the program. The Space for Geo information Board is preparing a strategy on how an international impulse on participation in the program can have more form and substance.

5. CONCLUSIONS

- In this paper the maturity of the SDI's from an organizational perspective have been presented. Basic elements in this approach are the implementation of a vision. This vision has been implemented, for a main part shared and frequently reviewed. Leadership is a second basic element. This leadership has been defined in the Dutch e-Government program and worked out in the Authentic Registration approach. The self-organizing ability is another key-element for the assessment of the maturity of the NSDI. In the Netherlands we are currently in the stage of intermediary and network. The examples of partnership building in the current situation illustrates the way in which the sector is actively helping in solving identified problems in cooperation with the responsible authorities.

- The first partnerships case on GBKN illustrated the ability on how a public private partnership is able to produce, maintain and finance a nationwide large scale digital data set. This dataset is part of the vision we had developed in the last ten years in the Structure Plan for Land information and the Authentic Registration approach. The GBKN has the ambition being qualified as an authentic registration in the future. Authentic registrations are obliged to be used by government institutions. An interesting topic is the initiative of the partnership to start negotiations with central government on how the rights on the data of GBKN can be transferred to central government authorities. Also the other options will be negotiated. The Ministry of Housing and Building could be a new partner in the partnership of the GBKN, organized in the way as so far GBKN did in the past. An interesting debate will start with an inventory of the pro's and con's of providing the information of the GBKN based on dissemination costs or maintaining the current pricing policy approach in the future. The last solution will be very difficult because of the tension with the general conditions of the Directive for the reuse of public information. This Directive will be implemented in national law during this year. A positive element is we are at the stage of an open discussion between the main stakeholders and the government authorities on the use of this dataset. This open process between the different stakeholders will lead to a creative process in solving the main bottlenecks. can be optimized. So the partnership and the government authorities are actively working on solving these problems.
- The second case is a nice example which illustrates the stage of the current maturity of our NSDI and the way in which central government organizes partnership building in the digital national spatial planning process. On the one hand the Ministry of Housing and Building is making use of the standardization approach, which had been developed by the Ravi partners during the past ten years. These standards are further developed in the spatial planning sector. Portals are being developed, which are crucial for the digital exchange of spatial planning data between the different planning authorities on municipal, regional and central government level. On the other hand government facilitates the modernization of the spatial planning process and implements this vision in regulations. In the modernization of this planning process a relationship between the authentic registration vision will be organized. Two partnership clusters (modernization planning process and digitization of spatial plans related to the developed NSDI vision) will interact between each other and will optimize the digital planning process in the future. Interesting item in the future is on how the interaction between those two networks (between administration and geo information sector) will influence at the one hand the information supply to citizens, and other stakeholders in the spatial planning process based on new legal spatial planning process and at the other hand how the GI community can provide the right tools to the administration on how the exchange of the spatial digital plan can be optimized. A second interesting observation is the involvement of the Dutch GI community in the planning process creating sub surface plans.
- The third case illustrates the way in which the geo information sector works actively on innovation. The program is an example of the active role of the main stakeholders in the formation of partnerships. In the Space for Geo Information Program around fifteen consortia consisting of eighty partners are active in the innovation process. An

interesting point in the future is to show how the results of the Space for Geo Information Program are influencing the knowledge transfer between the different partners. This knowledge flow will be organized in the coming years. Another interesting topic is on how new knowledge tools will be developed between the partners, and in which way new knowledge competences will be developed.

These partnerships cases are at the moment a starting point for a new era in the Netherlands regarding an active interaction between the geo information sector and the responsible authorities for optimizing the Dutch NSDI in a new and challenging way.

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Bas Kok has been the Director of Ravi, Netherlands Council for Geo-Information, since December 1993. From 1994-1998 he was Vice President of EUROGI (European Umbrella Organization for Geographical Information). From 2000-2004 he has been co-chairman and since 2004 chairman of the GSDI (Global Spatial Data Infrastructure) working group on legal and economic aspects. He is an associate professor at Delft University of Technology. His research centralizes around the legal, and organizational aspects of National (Geo-) Information Infrastructures.

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