

A National Programme for Spatial Data Research

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Key words: Spatial data, SDI, research, development, education, capacity building

SUMMARY

A national programme aiming for spatial data research, development and education has been worked out. The programme is focussed on actions directed to support the development of the Swedish spatial data infrastructure (SDI).

In March 2007 a new Swedish SDI strategy was presented to Government. The work was led by Lantmäteriet, the national mapping, cadastre and land registry agency, and carried out with high involvement by the Geodata Advisory Board and other stakeholders. The strategy and the concrete actions being described in the document will be followed up and annually reported.

One of the strategic goals in the SDI strategy is to establish a more coherent research and development directed to support the development and implementation of the strategy. The R&D activities should emanate from helping to solve real problems and possibilities to cooperate internationally should be used.

Such a program for research, development and education has now been worked out and will be presented to Government in March 2008. Important findings from the work were also presented to Government in December 2007 as an input for its work with a government bill on future directions for the Swedish research and development in general. This bill will be presented to Parliament during autumn 2008.

The programme describes the need for research, development and education, the existing situation and actions needed to foster a more efficient coordination on the national level and with international activities. The programme covers organisational, legal and financial issues as well as technical issues and is based on a need to look upon R&D and education from new perspectives and not be limited to the traditional disciplines within geographic information technology. In many ways the SDI approach being outlined in the new Swedish strategy can be considered as a paradigmatic shift. A service oriented architecture for exchange of data and services will demand new ways to handle cooperation between different organisations in networks, efficient structuring of data and services, development of the supporting technical infrastructure with a national geo-portal and metadata catalogue, and adjustments of legislation and models for financing and pricing.

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1. THE SWEDISH SDI STRATEGY

The Swedish Government and Parliament has given Lantmäteriet an outspoken role as coordinator of the national spatial data infrastructure (SDI). The responsibility comprises coordination of production, cooperation, dissemination and research and development. The responsibility also includes coordination of the implementation of EC directives related to GI (such as Inspire and GMES).

The government has also decided to establish a high level advisory board (*Geodatarådet*) supporting Lantmäteriet in its coordination role. Furthermore, it has been decided to develop a national geo-data strategy covering all strategic issues related to the handling of geo-data in Sweden. The aim of the strategy is to give guidance to geo-data producers and users regarding development and use of standards and specifications, metadata and metadata-services, services for dissemination of information, policies for access and use, research and education as well as organisation and cooperation. Lantmäteriet is responsible to work out this strategy in close cooperation with the advisory board and other stakeholders. The strategy was presented by end of March 2007 and will then be annually updated. Thus the strategy was updated in March 2008 with a report on achieved results and description of planned activities for the coming year.

The development of the Swedish SDI outlined in the strategy document implies many challenges and needs for developments, both within the public and private sector. Several actions are also depending on activities being decided by third parties, such as the implementing rules for the Inspire Directive. Therefore, the realization of the strategy is based on the following approach:

- It is better to take several small steps than one big.
- It is important to follow up all actions being carried out, to learn from the experiences and be prepared for adjusting the plans.
- It is important to establish strong links with the users of data and services.
- It is important to constantly develop the cooperation within the network.
- The implementation of the strategy is focused on eight action areas:
 - Cooperation in a network as a basis for the infrastructure
 - Structuring the information
 - Technical infrastructure
 - National metadata catalogue
 - Geodetic reference system
 - Research, development and education
 - Legal framework

- Financing and pricing

The strategy will have an impact on all relevant stakeholders by supporting reduction of data collection and maintenance costs, improvement of data quality and consistency, added value through more easy combinations of data from different sources, improved access to data and development of e-Government.

In this connection it is important to stress that the implementation of the strategy not only will affect the public sector but also the private sector. The actors on the market are important and the strategy will support their activities by:

- Developing the market for value added products and services. One reason for this is that the strategy and its implementation will make the public undertakings more clear and by that help the market actors to evaluate the market potential and to take the risk to invest in product and service developments.
- Easier bringing basic geodata to the market (if they have such data) as the infrastructure will be open also for private actors.
- Being involved in projects related to the development of the infrastructure, such development of metadata services and the national geo-portal.
- Being subcontractor of services to public organisations being responsible for geodata.

2. STRATEGIC GOAL FOR THE R&D

The strategic goal for research, development and capacity building is expressed in the SDI strategy in the following way:

Sweden should have a system of co-ordinated research and development activities directed towards supporting the development of the infrastructure for geodata. These activities should be based on the need and possibilities for international co-operation. The provision of competence in the geodata sector, on the long-term, should be ensured through well-adapted basic and higher education and further training.

3. OUTLINE OF THE ACTION PLAN

An action plan for research, development and training in the geodata sector has been formulated and presented for Government and the stakeholders by end of March 2008. In the action plan emphasis has been placed on describing the need for development and training to support the national efforts that are given priority in the geodata strategy. In addition, related R&D and training in geographic information techniques and development of geodata services is presented.

The action plan is divided into the following parts:

- A description of the needs for research, development and training in the geodata sector, with particular emphasis on the work that is needed to realise the goals of the national geodata strategy.
- An overview of on-going research, development and training in the geodata sector in

Sweden (including type, organisation, financing).

- An international comparison to help identify the prioritising that is done in other countries and what possibilities for co-operation exist.
- An overview of Swedish research in the geodata sector.
- An overview of the support for R&D and training in EU's funds and programmes.
- An analysis of the deficiencies that may exist in Swedish research, development and training in the geodata sector.
- A presentation of proposals – expressed as strategic goals and tangible efforts – to improve the pre-conditions for R&D and training in the geodata sector.
- The purpose of the action plan is to encourage the different bodies –users and producers of geodata, research and development bodies, the Research Council and decision makers – to contribute to improving the pre-conditions for Swedish research, development and training in the geodata sector. In this way, the pre-conditions would be created to satisfy the aspirations and demands that are placed on the future provision of geodata, in accordance with the intentions of the national geodata strategy.

4. FUTURE WORK

The geodata strategy is based on step-by-step development. This is also the case regarding the action plan for research, development and training. It can be stated that there is both a need for structural measures in order to create better long-term pre-conditions for co-ordinated and applied R&D and training activities and an immediate concentration of effort focused on the development of knowledge in this sector. Particular efforts should, therefore, be made by all parties to set priorities for R&D and training in the geodetic sector. This should most suitably be done integrated with the work to support the realisation of the government's action plan for e-governance.

Initially, a number of strategic goals have been identified for improving research, development and training activities:

- *Create a better national overview and develop better co-operation:*
A strategic goal is to prepare one single listing of R&D and training needs on which to base priorities and stimulate increased co-operation. The list should be based on an analysis of the development of the national infrastructure for geodata.
- *Clarify where the responsibility for research in the geodata sector lies*
A strategic goal is that one or several research councils should be given full responsibility for handling R&D issues within the geodata sector.
- *Create a list of all R&D funding for projects which support the geodata strategy*
With links to the government's action plan for e governance and this action plan for R&D and training, a programme should be formulated and a full presentation of available funding made. A strategic goal is that joint efforts should be made to begin the research and development work that is needed in order to realise the goals set up in the geodata strategic plan.
- *Develop better international co-operation*

Swedish research in the geodata sector has a relatively well-established contact network and a good overview over international research activities, but co-operation in specific programmes and projects is far too limited. A strategic goal is, therefore, to create the pre-conditions for better international co-operation. International co-operation in the development of models and frameworks for infrastructure for geodata is also important. This applies not only to the implementation of INSPIRE but also to the co-operation which is taking part between other players, such as between defence authorities.

- *Establishing test environments*
A strategic goal is to develop test environments which can verify service-based exchange of data in accordance with the geodata strategy and that the net services, which are required according to INSPIRE, function in a working environment. The test environments should function as a focal point for producers, users and researchers. The goal also includes making it possible for users within R&D and training fields to utilise data and services from public sector suppliers of geodata. An example is the development of the Digital Map Library to include increased volumes of data and more services.
- *Stimulate development in the private sector*
A strategic goal is to create better pre-conditions for the development of the private sector in the geodata sector through, for example, close co-operation between the universities, public sector administrations and the private sector in so-called public-private partnerships (Swe: OPP).
- *Ensure that the necessary competence is available*
A strategic goal is to satisfy the need for competence by co-ordinated efforts to recruit persons to further education and training as researchers.

5. PRIORITISED ACTIVITIES

In the action plan in appendix 5, there is a presentation of the considerations concerning alternative ways to achieve the strategic goals and also the following practical proposals for how this could be done:

- Initiate the establishment of a R&D forum with the task of creating an improved national overview and co-operation within the R&D and training fields. The forum should contain representatives from the universities, government administrations and the private sector.
- Act to ensure that one or several research councils are given full responsibility in the geodata sector and that dedicated funds are made available for the research and development work that is required to support the implementation of the geodata strategy.
- Develop collaboration with various bodies in Europe by, for example, signing long-term technical collaboration agreements with the EU's research organisation, the Joint Research Centre.
- Develop test environments, for example in the armed forces' test and development centre in Enköping and with Future Position X in Gävle, for the service-based exchange of data and services in accordance with the model that is described in the

geodata strategy.

- An analysis of the framework for implementation of the geodata strategy internationally (for example, INSPIRE, UK Ministry of Defence Architecture Framework, MODAF and NATO Architecture Framework, NAF) and participation in the work for the service- based exchange of geodata (for example, through the Organization for the Advancement of Structured Information Standards, OASIS).
- Recruit persons interested in strengthening co-operation between the public and private sectors and develop models for collaboration. Networks that have already been established should be made use of and here ULI can play an important role.
- The universities' advertising of their training programmes should be complemented by a national information programme promoted by branch organisations.
- Begin co-ordinated activities to develop and finance training modules that can support the development of courses for a broader education in the geodata area.
- Support the development of a European Computer Driving Licence for GIS.
- Collect the basic material for specifying levels of competence in the geodata sector for a possible future certification.

REFERENCES

The Swedish geodata strategy (with annexes)

BIOGRAPHICAL NOTES

Born 1947, Civil engineer in land surveying at the Royal Technical University in Stockholm in 1971.

Broad experience and knowledge of geoinformation from over 35 years of work within Lantmäteriet (the National Land Survey of Sweden), the Swedish Development Council for Land Information, the County Administration in Dalarna, the Ministry of Housing and Planning and the Ministry of Industry and Commerce. During the last ten years he has been working with strategic issues and international relations at Lantmäteriet's head office.

An important activity area during the last ten years has been participation in the development of the Swedish SDI, standardisation of geospatial information, preparation and implementation of the Inspire Directive.

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TS 3G – Capacity Building
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6/6

Integrating Generations
FIG Working Week 2008
Stockholm, Sweden 14-19 June 2008