Issues and Direction of Geospatial Information Policy in Korea

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Abstract

It has been around 12 years since National Geographic Information System (NGIS) introduced into Korea. NGIS of Korea obtained excellent results including (1) establishment for national spatial data infrastructure, (2) increasing the effectiveness of administrative tasks, and (3) provision of spatial data service to citizens. But, NGIS of Korea faces new challenges. Confronting the new information environment including ubiquitous or new web services, and demanding mobile or 3-D spatial data, new directions of NGIS policies should be considered. The strategies for national spatial data infrastructure are also necessary to change for the satisfaction of users' demands. This research examines the 12-year of NGIS implementation history of Korea. After that, this research tries to find better policy directions for the future along with the important national spatial data infrastructure factors including Frame Data, GIS Standard, Data Distribution and GIS Technical Development.

Keywords : NGIS, GIS Policy, NSDI, Korea

1. Process and Status of National GIS Project

The 1st National GIS Project (1995~2000) was intended to implement spatial information, with the goals of strengthening national competitiveness and improving administrative productivity. In order to realize these goals, the government constructed spatial information DB and established national GIS standards and developed GIS software. In this period, the government concentrated on the computerization of the national base map, which was the basis of national sp[1]atial information. In 2000, it laid the groundwork for the national geographic information system, through formulating and executing the「Act on the Implementation and Utilization of the National Geographic Information System」.

The second national GIS project (2001~2005) was aimed at realizing a digital national territory through the expansion of the national spatial information infrastructure. In order to actualize this, the infrastructure environment was continuously implemented through a range of initiatives, and this included the arrangement of the foundation of the digital national territory, the distribution of geographic information via the Internet, core GIS technology development & industry support, standardization and manpower cultivation. In this period, the government concentrated on implementing the application system with the framework data. The framework data included administrative districts, traffic, marine & water resources, cadastre, geodetic control points, topography, facilities, satellite images and aerial photos: geographical information that became the most basic framework of the nation.

The third national GIS project (2006~2010) set the goal of building up the infrastructure for the realization of Ubiquitous territory. To achieve this goal, the government has expanded, reinforced, and maximized GIS utilization, developed GIS's core technologies, established a national GIS standard system, and advanced GIS policy. The concept of ubiquitous territory refers to an environment in which everyone can acquire and utilize spatial information easily, anytime and anywhere. To achieve this, the government plans to complete the framework data implementation,

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to implement the integrated GIS DB, and to develop the Intelligent National Territorial Information Technology before 2010.

<Table 2> National GIS Project Activities

Description	1st National GIS Project	2nd National GIS Project	3rd National GIS Project
Implementation of geographic data	•Topographical map and cadastral map computerization •Implementation of “special” maps, such as land utilization status map	•Implementation of framework data by part, such as road, river, building and cultural heritage	•Inclusion of Statistical Districts in framework data •Completion of framework data implementation to 2010
Implementation of application system	•Implementation of underground facilities	•GIS application system development, such as land utilization, environment, agriculture and marine	•Linkage and integration of individual GIS application systems
Standardization	• Formulation of DB implementation-related standards, such as national basemap and “special” maps • Formulation of geographical information exchange and distribution-related standards	•Formulation of 1 standard for framework data, 13 standards for geographical information implementation, 5 standards for distribution, and 4 standards for the application system	•Re-establishment of framework data standard •Modification and supplementation of existing standards •Strengthening of standard application PR
Technology development	•Mapping technology, DB Tool, GIS S/W technology development	•Technology development such as 3-dimensional GIS, and high-precision satellite image processing	•Intelligent National Territorial Information Technology Development project
GIS education	•Manpower cultivation through informatization labor project •Offline GIS education	•Offline and Online GIS education •Education materials and practice program development	•Operation of 15 GIS education universities •Production of Online education contents
Distribution	•National geographical data distribution network's pilot project	•Implementation of national geographic data distribution network: Total of 139 types and about 700,000 cases registration	•Same as left

2. Current Plan

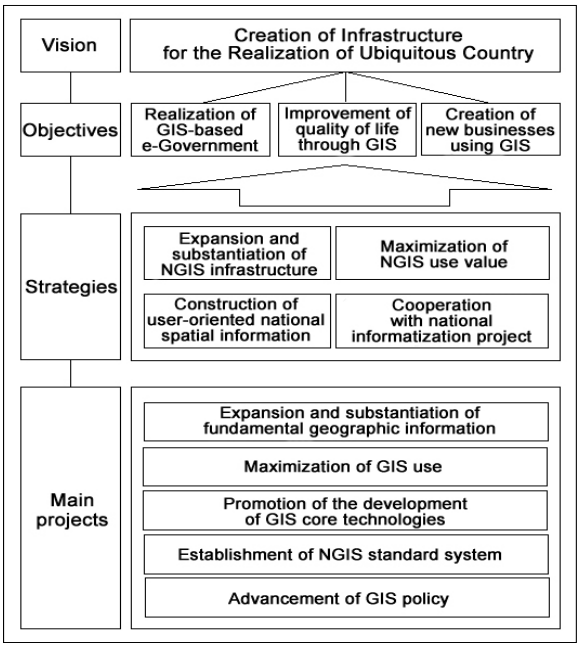
As shown in <Figure 1>, the Korean government has resolved ‘infrastructure development for the realization of ubiquitous national territory' as the policy principle behind the currently-implemented third national GIS project. The goal of the project encompasses the public sector, the civil sector and industrial sector. The public sector goals target the central government and the local governments, and include the implementation of GIS-based e-government. The civil sector goals include the promotion of civil safety and convenience through the utilization of GIS. Also, the industrial sector will research new industrial developments, such as the service utilizing GIS and g-Contents development. Strategies for the third national GIS project are follows.

Firstly, Strengthen the national spatial data infrastructure, such as the framework data, standard, distribution technology development, and GIS education. It is necessary to modify, supplement and update the national spatial data infrastructure continuously, not simply execute for a certain period. Accordingly, the third national GIS project will concentrate on reinforcing and enhancing the national spatial data infrastructure.

Secondly, maximize the application value of the national GIS. It intends to execute national territory informatization, to enable active responses to changes in the information environment. It will also implement the Integrated Land Information System, which links or integrates individually operated information systems, to easily apply spatial information anytime and anywhere.

Thirdly, Implement a user-oriented national GIS. In the beginning of the national GIS project, the focus was on building the national spatial data infrastructure. However, in this stabilization phase, national GIS project aims to implement custom-made geographic information, or an application system desired by users.

Fourthly, because the national GIS is one part of national information infrastructure, the national GIS project will not independently execute the project, but collaborate with other national informatization-related projects. For example, it is effective to maintain a cooperative relationship with e-government projects and IT-based projects.



<Figure 1> The 3rd NGIS Master Plan Schema

3. Issues and Director of NGIS Policy

3.1 Framework Data

The goal of the framework data implementation project of the third National GIS Project (2006~2010) is to complete the implementation of framework data and to improve its quality. In order to complete the implementation of framework data by 2010, the cooperation of the institutions that implement the framework data is crucial. Accordingly, the cooperation system of the institutions implementing the framework data is to be strengthened, mainly by the Ministry of Construction and Transportation.

Next, the requisites of framework data must be definitely determined, in order to improve the quality of framework data. Because framework data are currently extracted from the digital topographic map, there is an insufficient requisite as topographic information. Accordingly, the requirements of quality will be determined, such as time accuracy, position accuracy, attribute accuracy, completeness and consistency.

As the framework data is widely utilized by all, everyone should be able to easily utilize it. To this end, the framework data must be accessible via the Internet, from anywhere and at any time. If possible, it must be provided free of charge. Therefore, the framework data are scheduled to be provided effectively through the National Geographic Information Clearinghouse (NGIC).

3.2 GIS Standard

When the National GIS project is executed according to the prescribed standards, budget waste can be prevented, and synergy can be created through improved efficiency and interoperability between projects. Accordingly, GIS standardization has been pursued from the earliest stages of the NGIS Master Plan.

Standardization means determining a common system and following it, so as to enable a range of different users to share data or a system. The system requires data, a method of making the data, and a method of exchanging the data. Also, to enable multiple users to follow it, there needs to be reasonable discussion and the approval of an authorized organization. For such a system, the standard system is composed of an object of standardization, a method of standardization, procedures of standardization, and organization of standardization. That is, it is necessary to establish what will be standardized, which method will be used for the standard, which procedures will be executed for the standard, and who will make the standard. Accordingly, the GIS standard system to be established for the NGIS was composed of the object of GIS standardization, the method of GIS standardization, the procedures of GIS standardization, and the organization of GIS standardization.

3.3 Data Distribution

As the National Geographic Information System Project (NGIS project) has been actively executed from 1995, multiple public institutions, including the central government, local governments and government-invested institutions, have implemented the spatial data required for the project. However, as there is no amicable information exchange among the institutions that implement the spatial data, data are repeatedly implemented, or implemented data is not commonly utilized. That is, problems of inefficiency occur.

In order to solve such problem and to search & utilize the spatial data without any restriction of time and space, anywhere and at any time, the National Geographic Information Clearinghouse project was launched. It has been conducted since 2000 by the Ministry of Construction and Transportation, according to the second national GIS master plan. As the result, the National Geographic Information Clearinghouse, which can distribute the spatial data produced by nationwide public institutions online, has been implemented.

In order to provide various spatial data and application services by developing the existing performance, we intend to expand our partnerships with the private sector and to increase the variety of content and the convenience to the user. We plan to create added value and to activate related industries through spreading, utilizing and promoting such spatial data.

3.4 Development of GIS Technology

The Intelligent National Territorial Information Technology Development project intends to contribute to the improvement of quality of life in the public and private sectors by advancing the spatial information technology under the vision of 'Infrastructure building for ubiquitous territory actualization'. To this end, real-time territory management, convenient city operation and safe construction will be supported through the development of the primary territorial information technology for territorial spaces, cities, and SOC. In this project, the technology development projects of five sectors including the spatial information infrastructure, territory monitoring, city facility intelligence, construction informatization and u-GIS combination are scheduled by 2010, mainly by the intellectual territory information division of the Korea Institute of Construction & Transportation Technology Evaluation and Planning.

In the spatial information-based infrastructure project, the base infrastructure improvement, the spatial information acquisition equipment development, and the implementation of object-based territory spatial information for spatial information infrastructure innovation are scheduled. In the territory monitoring project, air & ground monitoring technology, integrated monitoring management system, and monitoring data application system development for real-time territory monitoring are scheduled.

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