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Development of the Geographical Names Information System

Submitted by the Republic of Korea **

Summary

It was with the aim of ensuring the efficient management of the Committee on Geographical Names and smooth coordination with the geographical names service that the existing geographical features and land service system and the management system were integrated. Following this integration, not only has the quality of services provided to the public been improved but greater accuracy has been achieved in geographical names services. Efficiency in the work of dealing with geographical names and the management of the database is expected to ensure the easy and convenient use of national geographical information resources and it is hoped that even a real-time information service will be made available. The newly developed national geographical names information service is provided on the NGII homepage (www.ngii.go.kr) and the Land Portal (www.land.go.kr).

1. Background and Purpose of the Project

Due to flaws in the geographical names service as well as the geographical names management system it was recognized that there is a need to improve and reconstruct the geographical names database (DB) schema. This will ultimately lead to the better provision of information on geographical names in both qualitative and quantitative terms. In addition, programs for the prevention and the verification of errors are required when inputting geographical names to enhance both the quality of civil services provided and confidence in the system amongst the public.

As the national coordinate system used has changed from the Tokyo Datum to the World Geodetic System, there is a need to incorporate latitudinal and longitudinal information for geographical names.

It is also necessary to improve the efficiency of the work of the management and deliberation of geographical names by integrating and improving the geographical names service and the system for managing geographical names.

2. Outline of the Project

A. Current Status of the Geographical Names Management System

The geographical names management system comprises only forty-three name classifications (mountains, rivers, towns, etc.), with Tokyo Datum based location information for each name. In addition, due to the insufficient hardware infrastructure (the application server and its DB server programs are installed on the same hardware) and out-dated equipment (HP LH 6000 produced in 2000), it has not been possible to ensure the provision of a good out-bounding web service to the public in a fast and convenient manner.

Since the data schema of this system is different from those of geographical features, it is not possible to provide an instant service for official geographical names. It takes a long time to find geographical names and their location with this system. These problems have prompted constant complaints from the public.

B. Reconstruction of the Geographical Names DB

1) Improvement of the DB geographical name schema
We re-redesigned the structure of the geographical names DB following an analysis of the previous database including the following points :
 a) Classification based on the subject of the geographical name (administrative boundaries, natural features, cultural features, etc.) ;
 b) Classification based on the feature type of the geographical name such as dots, lines, and faces ;
 c) Concept of the life cycle of geographical names showing the creation, change and abandonment of geographical names

2) Reconstruction of the current DB based on the improved schema

a) Reconstructing the existing geographical names DB based on the improved schema ;
b) Checking the register and the DB of geographical names ;
c) Adding information that has been omitted.

3) Redistribution of the reference frame for geographical locations (latitude and longitude)
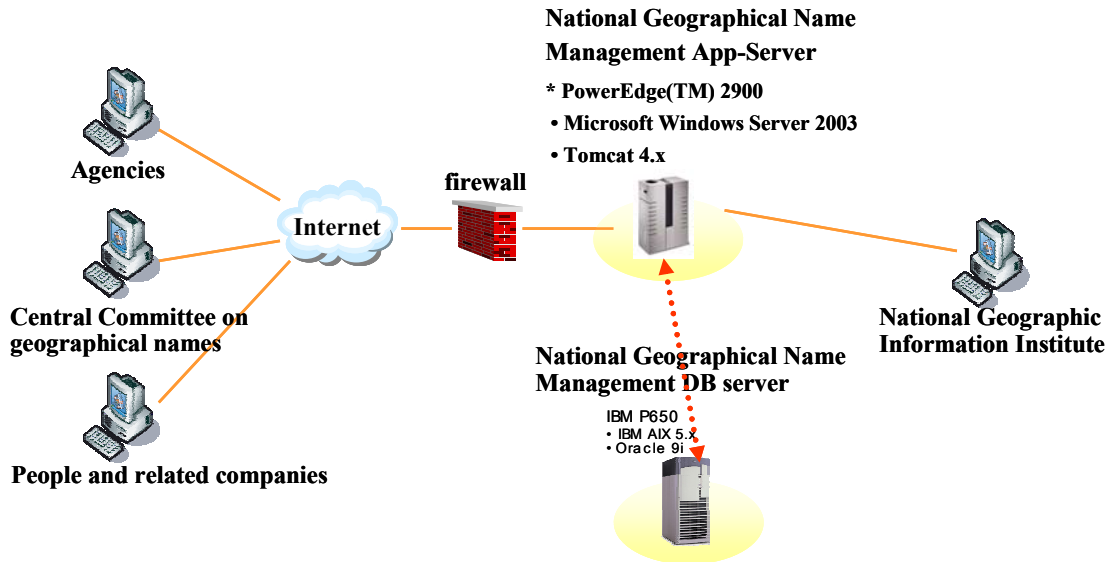 a) Changing the reference frame from Tokyo Datum-based to the World Geodetic System.

C. Improvement of the Geographical Names Management System

1) System change based on the expansion of the geographical name schema
2) Integration of the geographical names service system and the geographical names management system
  a) Updating, input and output of data online
  b) Various search methods
  c) Reporting data, including in the form of spreadsheets and the changes in the register of geographical names
  d) A special communication site exclusively for the members of the Committee on Geographical Names to exchange information
  e) Strengthening capability to collect statistics.

3) Acquisition of H/W to enhance the speed of the web service
  a) Developing a web server which is suitable for the Internet 'geographical features and name service' system
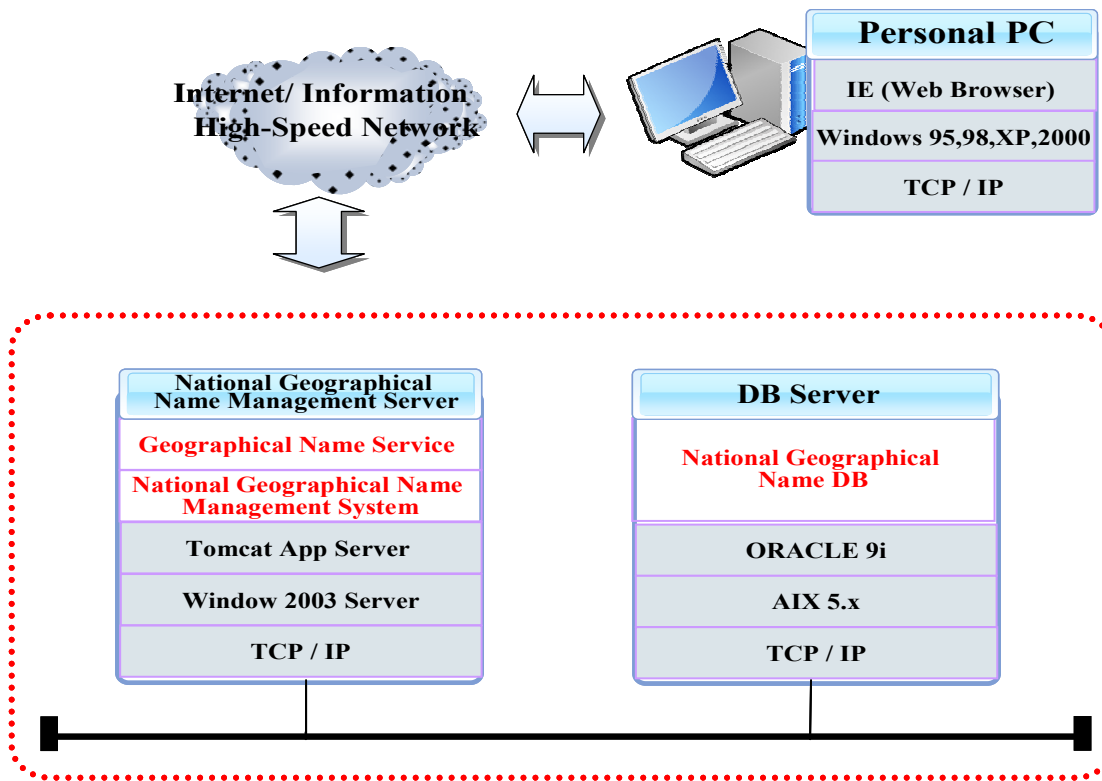 b) Integrating the geographical names service and the management service

3. System Configuration

In order to improve the efficiency of DB management and to maintain the consistency of data, the geographical features and name service system and the geographical names management system have been integrated into one single system.

-   H/W configuration

National Geographical Name
Management App-Server

* PowerEdge(TM) 2900
  • Microsoft Windows Server 2003
  • Tomcat 4.x

Agencies

firewall

Internet

**Central Committee on
geographical names**

National Geographical Name
Management DB server

IBM P650
• IBM AIX 5.x
• Oracle 9i

People and related companies

**National Geographic
Information Institute**

- <u>S/W Configuration</u>

**Internet/ Information
High-Speed Network**

Personal PC

IE (Web Browser)

Windows 95,98,XP,2000

TCP / IP

**National Geographical
Name Management Server**

Geographical Name Service

National Geographical Name
Management System

Tomcat App Server

Window 2003 Server

TCP / IP

DB Server

National Geographical
Name DB

ORACLE 9i

AIX 5.x

TCP / IP

4. National Geographical Names Information System

A. Improvement in the Structure of the National Geographical Name Information

The change in DB schema includes: first, classification based on the subject of the geographical name (administrative, natural, cultural, etc.); second, classification based on dots, lines, and faces; last, the concept of a life cycle according to the creation, change and abandonment of geographical names.

1) Subject classification
  a) Geographical names of administrative units: si/do, agencies of si/gun/gu, agencies of up/myon/dong, dong/ri, etc.

  b) Natural geographical names
    (1) Mountainous districts: mountain ranges, mountains, valleys, rocks, cliffs, ridges, etc.
    (2) Rivers: rivers, streams, lakes, mid-channel islands, waterfalls, swampy land, springs, etc.
    (3) Plains: plains, others
    (4) Animal and plant: forests, etc.
    (5) Community: towns
    (7) Others: caves, banks, ferries, bridges, lighthouses, ports, harbors, parks, hot springs, ramparts

  c) Names of cultural geographical features
    (1) Economic: mining, irrigation facilities, agricultural land, commercial businesses, fisheries, manufacturing industries, etc.
    (2) Transport: road facilities, accommodation, boarding facilities, transiting facilities, sign facilities, etc.
    (3) Society and culture: government and public offices, leisure facilities, tourism facilities, education facilities, religious facilities, ethnic customs, etc.

2) Classification based on dots, lines and faces

3) Through the drawing up of histories of geographical names, it is possible to check the change of such names from the past to the present.

From a DB based on Zeus DBMS, 120,000 geographical names have been changed according to the improved schema and transferred onto the new DB based on Oracle DBMS.

Errors and omissions have been checked and verified by comparing the previously developed data on geographical names and the geographical names register.

The previously developed location information on geographical names is based on the Tokyo Datum. As the World Geodetic System is to be applied from 2010, the location information of the national geographical name management system has been changed based on the World Geodetic System.

B. Development of the National Geographical Names Management System

In order to improve the national geographical names management system and to effectively develop information on geographical names, a system architecture has been designed and facilities and S/W established taking into consideration such factors as expanding the system and

enhancing efficiency.

The procedure for the creation and change of a current geographical name is as follows: individuals, groups, or the National Geographic Information Institute (NGII) request that the si/gun/gu create and change a geographical name. The geographical names agencies of the si/gun/gu review this and bring it up for discussion at the geographical names agencies of the si/do.

After the agencies of the si/do have deliberated and settle the scheme, they report this to the Central Committee on Geographical Names. The Central Committee on Geographical Names finally deliberates and decides upon this scheme and announces it in the Official Gazette. It is then corrected and registered in the geographical names register, its database, and map by the National Geographic Information Institute (NGII).

Classification	Function	Procedure
Si/gun/gu	Creation/change/abandonment of registration of geographical name sent to geographical name agencies of si/do	Si/gun/gu's deliberate on geographical name Geographical name presented to si/do
Si/do	Deliberation/decision on registration of geographical names sent to NGII	Si/do's deliberate on geographical name Presenting geographical name to NGII
NGII	Deliberation type classification (NGII) Scheme allocation/vote (NGII)	The Central Committee on Geographical Names Scheme allocation (document, deliberations on discussion)
The Central Committee on Geographical Names	The substance of the deliberations on the registration of the geographical name	Deliberation on geographical name by the Committee members
NGII	Notice and registration (NGII)	Geographical name notice

The newly developed national geographical names information service is provided via the NGII homepage (www.ngii.go.kr) and the Land Portal (www.land.go.kr).

5. Conclusion

The purpose of the improvement of the system is to provide a national geographical names

information service on the World Wide Web to all users who are curious about national geographical information and need to know the origins of geographical names. With the aim of ensuring the efficient management of the Committee on Geographical Names and working with the geographical names service effectively, the existing geographical features and land service system and the system for managing them have been integrated. Due to this integration, not only has the quality of service provided to the public been improved but greater accuracy has been achieved in the geographical names service. The efficient functioning of the geographical names and DB management is expected to facilitate the use of national geographical information resources in an easy and convenient manner and even a real-time information service is to be made available.