

A Study on the Introduction of GIS to the Construction Approval/Permission System

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Abstract. The Construction Approval/Permission System enables people to file a request for, and inquire about and process a certificate of construction approval, either through the System's website or a hard document, whereas the concerned approval agencies receive, complement, and approve civil requests, as well as manage the approval register. The System is used mainly by the Ministry of Land, Infrastructure, and Transport, and requires a GIS application to improve the overall convenience of its processing of various civil applications for approval, including the granting of permissions for private use of roadways, rivers, and public waters.

Keywords: Construction CALS, Approval Permission System, GIS

1 Introduction

The CALS (Continuous Acquisition & Life Cycle Support) System is a strategic information system initiative designed to help associated officials and construction professionals exchange diverse information generated during the planning, design, construction, and maintenance phases of construction projects. Operationalized in 1998, it is made up of five subsystems and six operating standards. This paper proposes ways to improve the overall convenience of the use of the Construction Approval/Permission System, one of the subsystems of the Construction CALS System, and to make it appropriate for general construction businesses, by reviewing the current state of the Construction CALS System and analyzing the requirements of the spatial information technologies in other construction areas.

2 Current State

2.1 Current State of the Construction CALS System

The Construction CALS System is a collection of five subsystems built on the main portal of the Construction CALS System.¹ This unified portal provides such diverse services as ex post facto assessment of construction projects, design VEs, and online turnkey information. The five subsystems are as follows. The Construction Project

Management System helps associated professionals manage various documents and construction information generated during the design and construction phase of diverse projects. The Facility Management System manages the specifications, inspection history, and other information on the repair/reinforcement of various public facilities, including bridges and tunnels. The Construction Approval/Permission System electronically processes a total of 47 public businesses related to the approval/permission process. Finally, the Land Compensation System computerizes the basic research data and history management during the compensation process.

2.2 Application State of the GIS System to the construction CALS system

The National Geographic Information System (NGIS) project in South Korea began with the introduction in 1995 of the Basic Plan for the 1st National Geographic Information System. Presently, the government is pushing ahead with seven strategic initiatives covering 27 sub-goals in accordance with the Basic Plan for the 5th National Spatial Information Policy.²

The Korea Land Information System (KLIS) is a computerized system built by constructing a GIS-based essential spatial information database. It supports the land-related administrations of the central and municipal governments, including those that issue land utilization plan confirmation documents, by linking and consolidating the official ledgers and floor plans required for the land registry and associated administrations. The Korea Planning Support System (KOPPS)³ supports the establishment of national- and municipal-level spatial planning and land development policies, using scientific spatial analysis methods, which enable deregulation, formation of regional happy living districts, and promotion of creative industries

3 Application of the GIS System

3.1 Construction Approval/Permission System

The Construction Approval/Permission System has successfully innovated public services and administration of civil affairs by electronically processing on the Web the entire administrative process, from application to closing, in construction approval/permission businesses.⁴ It has halved the time required to process paper-based administrative works and to send/receive documents to/from different agencies. It is also the front office that interfaces with people with pending businesses with the central and municipal governments. Divided into the public system that is open to users of civil affair services, and the intranet for public officials, the system allows people to fill in application forms, attach the necessary documents, transmit them to the approval agencies, and make real-time inquiries on the status of the administrative processing of their application. The intranet system for public officials electronically processes the receipt of public applications for approval, the delivery of the documents to the concerned departments, consultations and inquiries on various supporting evidence and documents, delivery of the administrative decision, and

preparation and delivery of the approval document. The system supports the management of the approval registry, including the preparation of the registry on the private use of roadways and the automatic calculation of the charges for the private use of the roadways. However, since the approval system is an early system developed in 2003 and is thereby aging fast, it must be revamped into a more user-centric system.

3.2 How to apply the GIS system

The early GIS technologies in the 2000s were mostly based on commercial software, but those based on the open-source solution have since advanced sufficiently to a level enough to realize, for instance, the viewer function. The open-source products have been used on a limited basis due to such issues as the lack of warranty for code errors and the map loading speed. However, as such problems have been gradually resolved, more and more agencies are using the open-source system. Still, the open-source systems in the national administration network show some problems when faced with a sudden increase in the number of logged-in administrators or with an explosion of data traffic. Therefore, it must be carefully considered if GIS technologies that would generate heavy traffic must be adopted.

The Construction Approval/Permission System needs to ensure that there are no conflicting opinions among various concerned parties for each business with regard to the site location and neighborhood information, by applying the GIS system to the application for and the processing of private land use in jobs associated with the approval of the private use of roadways, rivers, and public waters. It is also advised that an in-depth decision be made with regard to the handling of the approval/permission, by linking the land registration map with the national spatial information system. This would again qualitatively improve the administrative services by reducing the time and economic burdens of people with civil petitions. As the system allows public officials to have a single overview of the state of private land use by relying on the GIS system, the system is expected to enhance the work efficiency of the concerned officials in charge. The official in charge of the approval process can review the appraised land value using the land registration map and by calculating the charge for a specific land use. By charging the usage fee based on such computerized materials, any administrative mishap that may happen in the future, such as duplicate approvals, can be minimized. With the planned rollout of advanced GIS functions in the future, even the simulation function can be realized by comparing CAD drawings with the matching sites on the map.

The types of GIS data required for the approval process include: the land registration map, including roadway boundary line drawings, river district maps, maps of restricted areas in road surroundings, aerial photographs, maps of planned rivers, flood control district maps, and maps of appraised land values, as well as occasional utilization of other national spatial information consolidated systems.

4 Conclusions

The Government is developing the Construction CALS System to improve the efficiency of the administration of construction. However, as the system is aging already, it must soon be revamped into a new user-centric system. As the Construction Approval/Permission System handles the entire construction approval process, from the application to the closing, electronically on the Web and directly interfaces with users of the service, it must be renovated first. This paper proposed the phased introduction of the GIS system to the processing of applications for private use of roads, rivers, and public waters by reviewing the current state of the Construction CALS System and the state of GIS introduction in the country. With regard to the method of introducing the system, it is advised that a list of the required functions first be drafted, and then the GIS system be applied to the functions that can be realized with relative ease and that have a significant ripple effect on the overall work process. Any possibility of duplicate deployment should be avoided by identifying the GIS functions shared across the entire system. The space analysis function should also be introduced to advance the GIS function.

References

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