Building Records e-Search – Building Records at Your Finger Tips

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Key words:

SUMMARY

The Buildings Department (BD) keeps a repository of the building plans and related documents such as structural calculation sheets and occupation permits of existing private buildings in Hong Kong, collectively known as building records. These building records were submitted by the Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers under the Buildings Ordinance containing spatial information such as the approved layout, building height, plot ratio and site coverage. They are important references for business operators, building professionals, government departments and members of the public for such purposes as licence applications, the removal of unauthorized building works, as well as the applications for approval of building works related to existing private buildings, new development and redevelopment.

The Building Information Centre (BIC) of BD provides viewing and copying service of these building records to members of the public. Since June 2006, the BD has fully implemented a computerized building records management system, known as Building Records e-Search (BReS) for the electronic imaging, storage and retrieval of these building records. The BReS was built on the latest Web-based technologies and Geographic Information System (GIS) for easy navigation and map search. It has greatly improved the efficiency, user-friendliness and cost effectiveness of our records management system. Its implementation has led to a quantum leap in our service delivery providing instant viewing and copying service at our BIC. Besides, it enables the other government departments to gain access to the building records maintained by the BD thus providing a platform for data sharing among government departments. The BReS is a step forward in eGovernment. This computerized system has recently won the eGovernment "Most Popular ePublic Service" Bronze Award in the HK Information and Communications Technology (ICT) Awards 2006 organized jointly by the Hong Kong Institution of Engineers and Office of the Government Chief Information Officer. Our next target will be to launch the internet version of BReS to provide on-line access by the public.

TS 3D – Web-based Approaches to Spatial Information Management   1/7
Lam Siu-tong and Pauline Pang Mei-tuan
Building Records e-Search – Building Records at Your Finger Tips

Strategic Integration of Surveying Services
FIG Working Week 2007
Hong Kong SAR, China, 13-17 May 2007

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1   INTRODUCTION

1.1   Building Records Kept by Buildings Department (BD)

1.1.1   BD keeps a repository of the building plans and related documents of existing private buildings in Hong Kong, collectively known as building records. This repository comprises a total of about 20 million paper-based building records ranging from A4 to A0 sizes.

1.1.2   The building records were submitted by the Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers under the Buildings Ordinance (BO).   They contained inter alia, spatial information, including the approved layout, building height, plot ratio and site coverage of buildings erected on private lots in Hong Kong.   They are important references for business operators, building professionals, government departments and members of the public for various purposes such as licence applications, removal of unauthorized building works, as well as applications for approval of building works related to existing private buildings, new development and redevelopment.

1.1.3   BD is required to provide a service to the public for viewing and copying the building records kept by the department.   In this connection, its Building Information Centre (BIC) used to operate a paper–based building record management system for the public to view and to obtain copies of these building records.   Last year, BIC handled an average of about 340 applications every day.

1.2   Problems of Paper Records

There were problems with a paper-based building record management. Apart from the ageing and deterioration of the paper-based building records, the manual retrieval process was both time consuming and labour intensive.   The repeated retrieval of paper records may also cause inadvertent loss or misplacement of the relevant records.

1.3   This paper briefly describes how BD, as one of the e-government service provider, took on board the challenge to transform the paper-based record management system to a computerized one – Building Records e-Search (BReS).

2.   DEVELOPMENT OF BReS

2.1   Pilot Project

2.1.1   In 2000, as the result of a study, it was recommended that electronic imaging and

TS 3D – Web-based Approaches to Spatial Information Management   2/7
Lam Siu-tong and Pauline Pang Mei-tuan
Building Records e-Search – Building Records at Your Finger Tips

setting up of a computerized system should be considered to revamp the storage and retrieval process of the building records so as to enable BD to provide more expeditious and quality services. Having regard to the complexity and the cost implication of the project, the study also recommended BD to implement a pilot project for the purpose of identifying operational problems and working out the precise costing requirement for full-scale implementation.

2.1.2   As a start, BD implemented a pilot project in early 2001 covering a few districts. This pilot BReS was open for access by the public in mid 2001. Feedback from the stakeholders was positive. It was then decided that full scale implementation should be carried out covering the entire Hong Kong territory.

2.1.3   As lessons learnt from the pilot project, it was also decided to separate the project assignment into two tenders, one for electronic imaging (scanning) and the other for system development (software solutions) to harness the expertise of the service providers in their respective specialized fields.

2.2 Full Scale Project

2.2.1   <u>Imaging</u>

The project for the electronic imaging of building records and uploading of the converted images, was outsourced to an imaging company in 2004. The project scope involved a total turnover of 170,000 paper files for imaging, and 20,000,000 TIFF images amounting to more than 3,000 GB covering 18 districts over the entire Hong Kong territory.

In order to complete the work in 2 years' time, a production centre was set up by the contractor for conducting a round-the-clock operation. We have also deployed a team of BD staff to station on-site to perform the quality check and to provide on-site technical support to the contractor.

2.2.2   <u>System Development</u>

Starting 2004, separate Intranet and Internet system situated in two different locations providing a mutual back-up arrangement were developed to interface with the pilot system. The Intranet version was run in BD Local Area Network while the Internet version was hosted in the Data Centre of the Electrical and Mechanical Services Department.

In 2006, an Internet system with high availability features was set up in another Data Center operated by the Office of the Government Chief Information Officer (OGCIO) for better service level and resilience.

2.3 Use of Information Technology

2.3.1   The BReS was developed to build on latest web-based technologies, Geographic Information System (GIS) for easy navigation and map search, digital rights management

TS 3D – Web-based Approaches to Spatial Information Management   3/7
Lam Siu-tong and Pauline Pang Mei-tuan
Building Records e-Search – Building Records at Your Finger Tips

Strategic Integration of Surveying Services
FIG Working Week 2007
Hong Kong SAR, China, 13-17 May 2007

tools for the prevention of unauthorized printing and copying, as well as Two-factor Authentication Token system for access control.

2.3.2   To facilitate easy textual and geographical search of building records, BD has maintained some 100,000 building polygons and their corresponding building information. Moreover, BD has also acquired electronic data from other government departments, for constructing an electronic map including the base map of the Lands Department.

3.   ISSUES AND CONSIDERATION

3.1   Legal Framework

Basically, BD relies on the enabling powers in the BO to perform its duties or deliver services to the public.   Amendments to the BO were therefore required to empower BD to provide the plan viewing and copying service in e-format.   In line with Government's practice, the service is to be provided at a fee which is to be set at a level for recovering the cost incurred on BD in providing the service.   Costing exercise was conducted using the data obtained in analysing the work flow etc. of the pilot project, and the relevant fee charges are stipulated under the Building (Administration) Regulations.

3.2   Financing

3.2.1   There are both non-recurrent expenditure i.e. the capital cost of setting up of the system and the cost of imaging; and recurrent expenditure i.e. the running cost of the system including the cost of maintenance/operation.

3.2.2   For the non-recurrent expenditure of the pilot project, BD obtained the funding from the Save & Invest Account of the Financial Services and the Treasury Bureau.   As regards the full scale project, approval on the commitment for funding under 'Capital Works Reserve Fund – Capital Subventions and Major Systems and Equipment' from the Finance Committee under the Legislative Council was obtained.   Funding was also obtained from Administrative Computer Projects Committee (ACPC) under 'Capital Works Reserve Fund – Computerization' for the development of the complementary Web-based Retrieval of Building Records System.

3.2.3   For the recurrent expenditure, BD has committed to absorb the expenses under its own departmental expense vote.

3.3   Security Issues

3.3.1   <u>Security of Paper Records and e-Records</u>

During the image conversion, the staff of the contractor involved in the project was required to sign a non-disclosure agreement.   Dedicated transportation team was assigned for collection and return of building records and data. Reconciliation would be made at

TS 3D – Web-based Approaches to Spatial Information Management
Lam Siu-tong and Pauline Pang Mei-tuan
Building Records e-Search – Building Records at Your Finger Tips

4/7

Strategic Integration of Surveying Services
FIG Working Week 2007
Hong Kong SAR, China, 13-17 May 2007

checkpoints to ensure the security of the paper records and data.

Special tools/systems were used to track the movement of the paper records during the conversion process, to prohibit unauthorized access and to log all access to data and system preventing unauthorized amendment and replacement of converted images and data.

3.3.2   System Security

As mentioned in para. 2.3.2, digital rights management tools and two-factor authentication were adopted to enhance the system security.   Firewalls and Intrusion Detection System (IDS) are implemented in the Internet system. 7 x 24 surveillance against hacking activities and unauthorized access is provided by the operation team of Data Center to strengthen the network protection.

The BReS is in compliance with the Government's Baseline IT Security Policy, the Security Regulation and IT Security Guidelines.

3.4   Skills

Different specialized skills were employed in the project, namely, (i) sorting to identify the records to be scanned; (ii) imaging; and (iii) system development.   For (i), transfer of skill from BD staff to the imaging contractor was necessary.   There was a steep learning curve for the contractor at the beginning of the contract.   For (ii) & (iii), outsourcing was adopted to harness the latest advancement in technology in the respective fields.

3.5   Maintaining the Service Level

BD is pledged to make building records available for viewing within a specified period of time from the date of application.   In order not to cause any interruption to the service and to affect the service level, the imaging contractor was required under the contract to deliver the images and to upload the images on a district by district basis.   Furthermore, there were provisions in the contract for urgent return of paper files to BD when such files were needed for whatever reasons.   Progress meetings and technical meetings were conducted regularly to monitor the progress and to solve any problems encountered in a timely manner. Throughout the contract, BIC managed to maintain the service level as pledged.

4.   BENEFITS

The BReS has brought about the following benefits : -

4.1 Improvement in Service Performance

4.1.1   The BReS has greatly improved the efficiency and cost-effectiveness of retrieval process.   Time for retrieval can be shortened from days to minutes.   Instant viewing service can be, in most cases, offered to the members of public and the viewing would be available to

TS 3D – Web-based Approaches to Spatial Information Management   5/7
Lam Siu-tong and Pauline Pang Mei-tuan
Building Records e-Search – Building Records at Your Finger Tips

Strategic Integration of Surveying Services
FIG Working Week 2007
Hong Kong SAR, China, 13-17 May 2007

more than one customer concurrently. Viewing and copying service can be set at a lower fee level.

4.1.2 Under the paper-based system, the customers need to sort out the records they require from a large bundle of buildings records and fill out the application forms manually when they want to obtain copies of certain records. The BReS enables the public to search the required building records on screen through series of systematic indexes, and to place order directly on the system.

4.2 Sustainability

Deterioration and damage caused by repeated retrieval and handling of paper records posed problems over the legibility of the records. It might also cause loss or misplacement of paper records. BReS helps address these problems and preserve the valuable spatial information contained in paper records, enhancing their sustainability.

4.3 Benefits to the Community

As mentioned in para.1.1, the building records contain important spatial information. The enhancement of service delivery coupled with the lower cost of plan viewing and copying, facilitates the implementation of new development, redevelopment, as well as the carrying out of alteration and addition works, change of use, removal of unauthorized building works in existing buildings in compliance with the Buildings Ordinance. The Fire Services Department is also making use of the system to facilitate its work related to firefighting.

5. ACHIEVEMENTS

The BReS won the eGovernment "Most Popular ePublic Service" Bronze Award in the HK ICT Awards 2006 organized by the Hong Kong Institution of Engineers and supported by the Office of the Government Chief Information Officer.

6. WAY FORWARD

The full scale implementation of the BReS paves the way for extending the plan viewing and copying service of BD through the internet. It also paves the way for data sharing among government departments through an information portal.

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TS 3D – Web-based Approaches to Spatial Information Management   6/7
Lam Siu-tong and Pauline Pang Mei-tuan
Building Records e-Search – Building Records at Your Finger Tips

Strategic Integration of Surveying Services
FIG Working Week 2007
Hong Kong SAR, China, 13-17 May 2007

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TS 3D – Web-based Approaches to Spatial Information Management
Lam Siu-tong and Pauline Pang Mei-tuan
Building Records e-Search – Building Records at Your Finger Tips

7/7

Strategic Integration of Surveying Services
FIG Working Week 2007
Hong Kong SAR, China, 13-17 May 2007