For discussion
on 19 December 2018

Legislative Council Panel on Development

Implementation of Electronic Submission Hub

PURPOSE

This paper seeks Members' views on Buildings Department (BD)'s proposal to develop an Electronic Submission Hub (ESH) for centralised processing of electronic building plans and documents, as well as applications under the Buildings Ordinance (Cap. 123) (BO).

BACKGROUND

2.		At present, any person who intends to carry out building works under BO is required to appoint registered building professionals[1] to prepare and submit plans for the approval of the Building Authority (BA)[2]. BD is the central clearing house to process all building plan submissions from the private sector through the Centralised Processing System (CPS)[3]. Currently, registered building professionals have to produce multiple hard copies of buildings plans and supporting documents to BD. Upon receipt of these hard copies, BD would disseminate them to relevant departments

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[1]	Namely, authorized persons, registered structural engineers and registered geotechnical engineers registered under BO.

[2]	Under BO, the BA means the Director of Buildings. Minor works may be carried out under the simplified requirements of the Minor Works Control System whereby minor works submissions including forms, plans and documents are required to be submitted to BA. However, BA's prior approval of plans is not required before the commencement of works. Exempted building works under section 41(3), (3B) and (3C) of BO may also be carried out without obtaining prior approval by BA.

[3]	BD operates a CPS for building plans submitted under BO to ensure that all interested government departments and organisations are consulted and that their comments on private development proposals are collated by BD within statutory time limits allowed for processing building plans.

and organisations (CPS participants) for processing. There are up to 36 CPS participants; the number of hard copies required would depend on the types of submissions. Please refer to the list of 36 CPS participants at **Annex A**.

3.	BD commissioned a feasibility study in 2013 on the implementation of an electronic submission system of plans and documents under BO. Having regard to the level of maturity of products and technologies in the market, the substantial resources and efforts required to develop such system, as well as the readiness of the industry, the study recommended an electronic forms submission system (EFSS) be developed first to pave the way for the implementation of a full-scale electronic submission system in the future. Taking heed of the recommendation, BD launched the EFSS in 2016 under which practitioners may download, fill in, sign and submit forms electronically. The EFSS, however, has not obviated the need for practitioners to submit building plans and other large-sized documents to BD in hard copies.

4.	Subsequently, BD commissioned a review on the feasibility of implementing a full-scale electronic submission system for processing electronic plans and documents in 2017. Apart from the benefits of electronic submission including reduction in the use of paper and associated storage space, saving of administrative efforts, etc., the review also identified the tremendous benefits that a full-scale electronic submission system could offer by enabling the acceptance of building plans in Building Information Modelling (BIM) format by BD. BIM is a 3-dimensional (3D) design and modelling process involving the generation and management of digital representations of physical and functional characteristics of a structure. Instead of having numerous plans containing architecture design, construction and installation design, lists of quantities and cost estimates, etc. individually prepared and manually coordinated, BIM will assign all such plans to a 3D model. Users would be able to carry out planning, design and construction in a virtual environment at the early stage of a development project. Besides, BIM could detect clash arising from incompatible design, facilitate conformity checking of design features against building regulations with custom-developed plug-in modules, assist in coordination of various activities on-site, analyse the use of resources and viability of a project, improve communication amongst different project

teams, and provide useful records for future building maintenance. The use of BIM would minimise wastage during the project preparation and construction stages, such as wastage arising from the need to rework and idling resources during construction stage. This would in turn result in higher productivity and economical use of materials.

5.   All in all, the review recommended the development of a full-scale electronic submission system to improve the operational efficiency of BD and CPS participants in processing building plans and submissions, and to encourage the greater and fuller use of BIM in the industry, which is one of the initiatives in the *Smart City Blueprint for Hong Kong* published in December 2017.

PROPOSAL

6.   In view of the recommendations of the review, BD now proposes the development of an ESH as a digital centralised portal for receiving and processing building plans and documents, as well as other applications under BO as an alternative to the present paper-based system. With the support of the Secretary for Development and the Government Chief Information Officer, we propose that an ESH at an estimated cost of $214.4 million be developed.

JUSTIFICATIONS

Features of ESH

7.   ESH will open up many opportunities to enhance government services. The main features of the proposed ESH include –

(a) One-stop e-Counter: ESH will be a one-stop e-counter for submission of building plans and documents, as well as applications under BO electronically;

(b) e-Registration: users may create personalised accounts on ESH for performing subsequent progress tracking of various types of

submissions including building plan, consent, permit, licence applications as well as certificates and forms under BO.   Users may also receive reminders, notifications and announcements, and access to records of approved submissions or documents;

(c) e-Payment: users may make payment electronically to enjoy greater convenience and avoid manual errors;

(d) e-Referral: ESH, when launched in full, will serve as a portal for BD to refer submissions to all CPS participants and for the participants to provide comments to BD and users;

(e) e-Processing: plan processing could be carried out concurrently by different CPS participants, with comments by participants shared in the portal.   Computer-aided plan checking modules would be developed for compliance check of submissions in BIM format against building regulations; and

(f) e-Document Management System (DMS): ESH will integrate with DMS to handle large volume of submission data for efficient, reliable and secure retrieval, searching and archiving.

Anticipated benefits

8.   The proposed ESH will bring about the following benefits –

(a) Streamline development approval process

With the implementation of ESH, building professionals may submit their plans and documents electronically.   BA and all CPS participants could process such plans and documents via the electronic platforms.   ESH will not only save the time and manpower in submitting and resubmitting hard copies of plans or submissions; the corresponding travelling costs and printing costs would also be saved.   Through the automatic referral system, ESH will also improve the efficiency in distributing plans and documents from BD to other CPS participants.   Through the built-in online application progress tracking and alert system, users could keep track of the progress of their submissions.

Useful management data could be generated to relevant departments for monitoring purpose.

(b) Improve co-ordination between CPS participants

ESH will facilitate collaboration among BD and CPS participants in processing building plans. Views and comments on the plans made by BD and CPS participants will be shared electronically amongst themselves, allowing early reconciliation of conflicting comments if such arise, thereby compressing plan processing time.

(c) Encourage the greater and fuller use of BIM technology

While building professionals may now submit building plan documents in BIM format to BD as supplementary information to facilitate BD's plan processing[4], the absence of a full-scale electronic submission system has hindered them and CPS participants from enjoying the full benefits that BIM could offer (paragraph 4 above). ESH will encourage the greater and fuller use of BIM by building professionals in preparing building plan submissions for private development projects. This complements the government's initiative to require the use of BIM in major government capital projects starting from 2018, and help promote the adoption of BIM by the sector which is in line with the global trend.

(d) Promote Smart City Development

The electronic building plans prepared in BIM format received via ESH will be a rich and readily accessible source of information for promoting other smart city initiatives. In particular, building

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[4] Following the launch of EFSS, BD released a practice note in late 2016 providing general guidelines on submissions for building plans in BIM format stored in CD or DVD as supplementary information to facilitate plan processing by BD. However, BD continues to require the plans to be submitted in hard copies, and is processing the plans based on information contained therein.

information captured in BIM format would support the development of the Common Spatial Data Infrastructure (CSDI) which facilitates the sharing of geo-spatial data across government departments and various government-to-business applications including 3D digital map.

(e) Environmentally friendly

Currently, building professionals are submitting an average of ten sets of building plans for each first time submission. This is usually followed by the submission of voluminous plans covering site formation, foundation, drainage and other structural works together with associated calculations and documents, as well as amendment submissions following the first approved plans. ESH will help save paper and associated storage space for such submissions, and reduce the time and cost for printing and delivery of such plans by building professionals as well as recording and searching for such plans.

(f) Enhance communication between BD and users

ESH will support the use of Electronic Identity[5] and offers a one-stop shop for registered users (including general public) to receive customised notifications such as BD's publication of new and amended practice notes, circular letters and reports, as well as announcement on seminars, briefings and publicity events organised by BD. It will also allow online registration for and feedback on these events.

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[5] Electronic Identity (eID) is one of the digital infrastructures for smart city development in Hong Kong to provide local residents with a single digital identity and authentication method to conduct government and commercial online transactions and to sign documents digitally. It will be provided free for all Hong Kong residents starting from mid-2020.

FINANCIAL IMPLICATIONS

Non-Recurrent Expenditure

9.   We estimate that the total non-recurrent expenditure of the proposed ESH to be $214.4 million over seven years from 2019-20 to 2025-26.   The breakdown is as follows:

Item	($'000)						
	2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**	**2024-26**	**Total**
(a) Hardware	-	25,700	10,300	18,200	6,300	-	60,500
(b) Software	-	11,260	8,860	1,200	1,200	-	22,520
(c) Implementation services	6,800	7,680	7,640	10,580	10,480	15,030	58,210
(d) Contract staff	3,400	6,890	7,400	7,480	7,480	8,940	41,590
(e) Others	280	390	4,460	3,490	1,460	2,000	12,080
(f) Contingency	-	-	-	-	-	19,490	19,490
Total	**10,480**	**51,920**	**38,660**	**40,950**	**26,920**	**45,460**	**214,390**

10.   On paragraph 9(a) above, the estimate of $60.5 million is for the procurement of computer hardware, including servers, network facilities, security modules and backup equipment, etc.

11.   On paragraph 9(b) above, the estimate of $22.5 million is for the procurement of computer software, including operating system, migration software and information security software, etc.

12.   On paragraph 9(c) above, the estimate of $58.2 million is for the procurement of services from an external service provider for conducting system analysis and design, development, testing, installation, system migration, internal training related to ESH operation, security risk assessment and auditing in various implementation stages.

13.   On paragraph 9(d) above, the estimate of $41.6 million is for hiring information technology contract staff possessing relevant technical skills and experience to assist in the procurement, coordinating and monitoring

of the full system development lifecycle including but not limited to system design, installation, testing, implementation and system nursing.

14.   On paragraph 9(e) above, the estimate of $12.1 million is for other expenditures, including communication network (e.g. equipment rental for providing communication carriers and backbone switches), data centre expenses (e.g. setup for production data centre and disaster recovery data centre), BIM training for BD's staff and procurement of consumables (e.g. backup tapes).

15.   On paragraph 9(f) above, the estimate of $19.5 million represents a 10% contingency on the items set out in paragraphs 9(a) to (e).

Other Non-recurrent Expenditure

16.   The proposed implementation of ESH will require a project team involving in various activities including project management, procurement of hardware, software and services, system analysis and design, coordination with other departments and organisations, site preparation, user acceptance tests and implementation support, etc.   This will entail a non-recurrent staff cost of around $31.66 million from 2018-19 to 2023-24. BD will review the staffing requirement as the project progresses.

Recurrent Expenditure

17.   The on-going maintenance and support of ESH will require an estimated recurrent cost of about $17.0 million after its complete rollout. This expenditure covers the cost of hardware and software maintenance, renewal of software licence as follows –

	2026-27 onwards $'000	
(a) Hardware and software maintenance	6,950	
(b) System/application maintenance	8,370	
(c) Others	1,660	
(i) Consumables		160
(ii) Contingency		1,500
Total	**16,980**	

Savings and Cost Avoidance

18.   It is estimated that the full implementation of ESH will bring about the following annual cost savings and avoidance upon full implementation of the system –

(a) Notional savings of $12.7 million in staff efforts (being the staff cost of man-hours saved) for processing of plans and submissions;

(b) Cost savings of $1.9 million in the cost for scanning and storage of paper submissions; and,

(c) Cost avoidance of $7,760 million on social benefit for reduction of construction costs including labour and materials, and a benefit of $68 million for reduction of green-house gas emissions as a result of the use of BIM (paragraph 4 above).

IMPLEMENTATION PLAN

19.   We intend to roll out the first phase of ESH covering electronic submissions requiring only approval from BD (e.g. superstructure, cladding, curtain wall and glass canopy plans) starting from Q1 2022. It is BD's plan to extend ESH to submissions that involve referrals to works departments (e.g. demolition, drainage, excavation and lateral support plans) by Q4 2023 and to all types of submissions by Q2 2025.   Please refer to the timetable in **Annex B**.

PUBLIC CONSULTATION

20.   The Building Sub-Committee of the Land and Development Advisory Committee and the Authorized Persons, Registered Structural Engineers and Registered Geotechnical Engineers Committee were consulted in June 2018 on the proposal. Members of these committees, comprising representatives of stakeholder professional bodies and trade associations, generally supported the proposal.

WAY FORWARD

21.   Subject to Members' views, we will seek funding approval from the Finance Committee, specifically approval for the creation of a non-recurrent commitment of $214.4 million under Capital Works Reserve Fund Head 710 - Computerisation to cover the costs mentioned in paragraph 6 above.

ADVICE SOUGHT

22.   Members are invited to comment and support the proposed ESH.

Development Bureau
Buildings Department
December 2018

**Departments and organisations involved in the
Centralized Processing System of Building Plan Submissions**

Departments

1. Agriculture, Fisheries and Conservation Department
2. Antiquities and Monuments Office, Leisure and Cultural Services Department
3. Architectural Services Department
4. Civil Aviation Department
5. Civil Engineering and Development Department (including Geotechnical Engineering Office)
6. Tourism Commission
7. Department of Health
8. Drainage Services Department
9. Education Bureau
10. Electrical and Mechanical Services Department
11. Environmental Protection Department
12. Fire Services Department
13. Food and Environmental Hygiene Department
14. Highways Department
15. Home Affairs Department (including the Office of Licensing Authority)
16. Hong Kong Observatory
17. Hongkong Post
18. Housing Department
19. Labour Department
20. Lands Department
21. Marine Department
22. Office of the Communications Authority
23. Planning Department
24. Rating and Valuation Department
25. Social Welfare Department
26. Transport Department
27. Water Supplies Department
28. Hong Kong Police Force
29. Leisure and Cultural services Department

Organisations

30. Airport Authority
31. Hospital Authority
32. Mass Transit Railway Corporation Ltd
33. Urban Renewal Authority
34. Hong Kong Tramways
35. The Peak Tram
36. Ngong Ping 360 Limited

Timetable for Development of the Electronic Submission Hub

Tasks	Proposed Schedule
(a) Prepare tender documents, invite tender, tender evaluation and contract award	Q3 2018 - Q2 2019
(b) System design, to production commencement ➤ Stage 1 – for plans not requiring cross-department referral	Q3 2019 - Q1 2022
➤ Stage 2 – for plans requiring referrals to works departments only[6]	Q1 2022 - Q4 2023
➤ Stage 3 – for all types of plans	Q4 2023 - Q2 2025

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[6] Viz. Architectural Services Department, Civil Engineering and Development Department, Drainage Services Department, Highways Department, Transport Department and Water Supplies Department