For Discussion on
12 December 2008

Legislative Council Panel on Home Affairs

**Major Upgrade of Multimedia Information System
for the Hong Kong Public Libraries**

Purpose

This paper seeks Members' support for a proposed project to upgrade the Multimedia Information System (MMIS) of the Hong Kong Public Libraries (HKPL).

Background

2. MMIS is one of the few digital library systems in the world that provide access to both digital and analogue audio-visual (A/V) materials as well as digitised images through a single unified user interface. It serves as one of the HKPL's important tools in meeting the needs of the community for knowledge, information, cultural enrichment, intellectual stimulation and life-long learning. The system also plays an important role in the use of digitisation as a solution for preservation as well as dissemination of historical and heritage materials related to Hong Kong.

3. The HKPL's MMIS was first launched in mid-2001 upon the opening of the Hong Kong Central Library (HKCL). The system currently provides services to patrons through some 530 workstations at HKCL and 26 major and district libraries. The MMIS also provides services through the Internet. Patrons are provided with multiple search functions for effective access to the rich array of digitised library materials and enjoyment of A/V programmes on demand. The MMIS holds about 3 300 hours of digitised A/V materials, around 40 000 A/V CD-ROMs that are housed and played by jukeboxes, over 100 000 A/V materials that are played by conventional players such as CD, VCD, DVD, Laser Disc, VHS,

U-matic, audio cassette tapes, gramophone records, and over 2 million digitised images of valuable old Hong Kong newspapers, maps, manuscripts, photos, posters, etc. Patrons can easily reserve MMIS workstations and/or library materials through the system.

4. In addition to serving the MMIS workstations, the network infrastructure installed at the HKCL also supports HKPL's three other information technology (IT) systems. These include more than 1 000 workstations at HKCL and 65 branch libraries for public Internet access, around 150 workstations at HKCL for the check-in and check-out of library materials, and some 250 personal computers for daily office automation work of the HKPL's staff.

5. The MMIS has been well received by patrons since its launch. Around 1.5 million patrons use the system to get access to about 1.8 million items of library materials in 2007-08. It is anticipated that there will be an over 10% annual growth in the use of library materials through the MMIS. Furthermore, contributions of the MMIS to the public have been duly recognised through the winning of various IT awards[1]. Its role in preserving local heritage and culture is globally recognised through the incorporation of the MMIS into the United Nations Educational, Scientific and Cultural Organization's Archive Portal since 2003.

6. Although some minor upgrades and enhancements have been applied to the system in the past seven years, the fast advancement in IT has inevitably rendered some key components of the system obsolete. To cope with the present and anticipated future service needs of the public, the existing system has to be upgraded or replaced in a timely and well-planned manner such that the services provided to the public will not be adversely affected.

The Feasibility Study and its Recommendations

7. The Leisure and Cultural Services Department (LCSD) commissioned an external consultant to carry out a feasibility study in early

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[1] The MMIS received a Silver Award in the Application Category of the IT Excellence Awards 2001 organised by the Hong Kong Computer Society. It was further honoured with the Asia Pacific Information and Communication Technology Awards 2002 in the "E-Government & Services" category. The system also received a Merit Award in the Innovation/Application of Technology Category of the Civil Service Outstanding Service Award Scheme in 2005.

2008. The feasibility study was aimed at reviewing the service and operation of the existing MMIS and examining the feasibility of upgrading or replacing the system to meet anticipated needs.

8.   The results of the feasibility study indicate the need for conducting a major upgrade of the existing MMIS since it is incapable of meeting future demands. Upgrade of the existing system is a very complex process which may take about four years to complete. It is therefore necessary to start the work now.

Constraints of the Existing MMIS

9.   The existing MMIS encounters the following obsolescence and system limitation problems -

(a)   a number of system components[2] have reached the end of their life cycle. It is not feasible to further enhance them to meet new requirements;

(b)   the official maintenance support from the manufacturer for a number of system components[3] has ended. At present, the contractor concerned tries its best to provide maintenance support. Because of this, it is inevitable that the reliability of the system will deteriorate over time. If the system is not upgraded in a timely manner, the efficiency of our public library service would be seriously affected; and

(c)   the system application was custom-built with the use of the technologies almost a decade ago. It is extremely difficult and costly to apply new technologies[4] to the existing MMIS. It presents significant constraints to the library system in the provision of enhanced and new services to the public.

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[2] Such system components include Video Charger version 2, system software for audio/video streaming; Content Manager version 6.1.3, system software for Content Management System; Tivoli Storage Manager version 4.1.2.3, data backup and recovery software.

[3] Such system components include AIX version 4.3.3, an operating system for web and database servers; Websphere version 3.0.2.4, system software for web application; DB2 version 6.1, database software.

[4] Such new technologies include provision of MMIS service using mobile devices; provision of audio/video streaming through the Internet; provision of round the clock access to the MMIS materials through the Internet.

Proposed Upgrade of the MMIS

10.   The proposed upgrade would be a new digital library system integrating a content management sub-system, a multimedia streaming sub-system and various supporting sub-systems based on open standards and best practices of the IT and library industries.   Commercial off-the-shelf (COTS) package that could be customised to meet the HKPL's specific requirements would be considered.   The network infrastructure of HKCL will be upgraded for providing more effective data communication service.

11.   The existing system functions for the provision of different services to patrons will be examined and only those that support HKPL's missions and are highly welcomed by the public will be implemented in the proposed system.

12.   The upgrade is proposed not only to address the problems mentioned in paragraph 9, but also to provide enhanced services to the public, as well as improving the overall efficiency of the HKPL's internal operation and optimising the utilisation of its limited resources.   Potential new or enhanced functions to be implemented in the upgraded system include:

(a)   extension of the MMIS services from the HKCL and 26 branch libraries to all 73 static libraries (including 66 existing and seven new static libraries);

(b)   provision of the MMIS services via mobile devices such as mobile phones and personal digital assistants;

(c)   provision of personalised services such as Really Simple Syndication (RSS) services (e.g. automatic online feeds of updated MMIS and e-reference information, etc.) to keep users abreast of the latest information;

(d)   extension of MMIS services via the Internet from 16.5 hours per day to round the clock service;

(e) live broadcasting of events held in the HKCL to branch libraries or through the Internet;

(f) provision of enhanced electronic payment function for the existing charged printing service such as the use of debit cards;

(g) integration of MMIS with other information archives and academic institutions by adopting Open Archive Initiative (OAI) standards to share digitised materials, particularly those relating to local historical heritage and culture;

(h) application of a digital rights management (DRM) system to prevent unauthorised access and copying of digital library materials;

(i) provision of enhanced booking service for the general public to reserve MMIS workstations, as well as A/V booths; and

(j) provision of system management tools to facilitate effective system operation.

Anticipated Benefits of the Upgraded MMIS

13. The upgraded system will bring about the following benefits –

Readiness for future development

(a) built on new technologies and open standards, the upgraded system will allow easy integration of different technologies and solutions[5], resulting in a system that will better meet the public's aspiring demands;

Enhanced customer services

(b) extending the MMIS services to all static libraries;

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5 The upgraded MMIS will build on new technologies and open standards such as Open Archive Initiatives, a standard for digital libraries; Really Simple Syndication, a standard format for delivering up-to-date information regularly; MPEG4, a standard video format.

(c)   strengthening the role of MMIS as a "Virtual Library" without walls by making the system accessible by mobile devices and through the Internet;

(d)   providing new services such as RSS and mobile device services;

(e)   providing a gateway for the public to enjoy various electronic library information;

(f)   providing a high quality live broadcast platform to promote regular library events and A/V programmes;

(g)   providing enriched multimedia contents as the upgraded system will facilitate public access to more multimedia resources in other digital information archives and academic institutions adopting OAI standards;

Improved library operation

(h)   implementation of a DRM system that will facilitate LCSD's procurement arrangement with content providers on copyright issues in future content acquisition process; and

(i)   in addition to facilitating the general public, an enhanced booking system can alleviate the manpower requirement for manual handling of reservation requests for MMIS workstations as well as A/V booths.

Cost Savings/Avoidance of the MMIS Major Upgrade

14.   The proposed system will bring about an annual saving of $14,416,000 as from 2013-14 onwards, comprising the following realisable savings/notional savings/cost avoidance:

(a)   Realisable savings of $12,652,000 per annum as the running cost (including the hardware and software maintenance cost, rental of data lines, etc.) of the existing MMIS will no longer be required upon its decommissioning. The savings will be

ploughed back to cover most of the recurrent costs of the proposed system;

(b)   Notional savings of $1,067,000 per annum as the new system will be able to automate some of the existing manual operation such as handling of patrons' requests in reserving MMIS workstations and A/V booths; and

(c)   Cost avoidance of $697,000 per annum as the deployment of staff for new services can be avoided as a result of the use of system management tools to streamline the existing workflows. The cost for data communication and disk storage for new services will also be cut due to the use of the latest technologies in the new system.

Financial Implication

15.   The following estimates are worked out based on the feasibility study result.

16.   The MMIS Major Upgrade will require a non-recurrent expenditure of $93,119,000 over four years from 2009-10 to 2012-13 Details are at **Annex A**.

17.   The new system will require a recurrent expenditure of $16,416,000 per annum as from 2013-14 onwards.   The estimated amount will be partly offset by an annual saving of $12,652,000 being the running cost of the existing MMIS.   The additional recurrent expenditure arising from the proposed system is therefore $3,764,000 per annum and will be absorbed from within LCSD's existing resources.

18.   In addition, the implementation of the proposed system will entail a non-recurrent staff cost of $14,258,000 over a period of four years from 2009-10 to 2012-13.   LCSD will absorb the requirement from within its existing resources.

Implementation Plan

19.　　　Subject to funding approval from the Finance Committee in January 2009, a tendering exercise will commence as soon as possible and a contract for project implementation will be awarded around the third quarter of 2010.　The target is to have the upgraded system launched by mid-2012.　A tentative implementation schedule is at **Annex B**.

Public Consultation

20.　　　The initiative to upgrade the MMIS is supported by the Public Libraries Advisory Committee that advises the Government on the overall development strategy of the HKPL.　Furthermore, views of library users on the proposed system upgrade have been sought through a user survey conducted during the feasibility study.　Users in general welcomed the upgrade, which is expected to enable them to enjoy better and more effective library services.　Moreover, users' comments and suggestions on system features collected through regular channels such as Customer Liaison Groups meetings and reader's suggestion forms will be included in the specifications for the proposed system.

Way Forward

21.　　　To take forward the Project, we plan to seek funding approval from the Finance Committee at its meeting scheduled on 16 January 2009 for the major upgrade of the MMIS.

Home Affairs Bureau
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Non-recurrent Expenditure for Major Upgrade of the MMIS

	2009-10	2010-11	2011-12	2012-13	Total
	$'000	$'000	$'000	$'000	$'000
(a) Hardware	-	1,208	31,456	-	32,664
(b) Software	-	3,387	10,313	-	13,700
(c) Communication Network	-	-	634	290	924
(d) Implementation services	-	6,105	10,464	4,361	20,930
(e) Contract Staff	1,441	2,463	3,193	1,331	8,428
(f) Miscellaneous (site preparation, training, data conversion, consumables, etc.)	-	742	6,682	1,680	9,104
(g) Contingency	147	1,179	5,379	664	7,369
Total	1,588	15,084	68,121	8,326	93,119

Note:

Item (a): comprises hardware for the major upgrade of MMIS. The hardware includes database servers, application servers, web servers, other functional servers, network equipment, workstations, printers, A/V switches, jukeboxes, etc.

Item (b): comprises system software for servers, client software, library software package, multimedia streaming software and add-on software for new MMIS functions.

Item (c): comprises installation cost of data lines and Internet connection.

Item (d): comprises implementation services of the major upgrade of MMIS from external service providers. Main implementation activities include system study, application development/customisation, system installation and configuration, system integration and testing, production rollout, nursing.

Item (e): comprises engagement of services of contract librarian and IT professional staff to supplement the in-house project management teams.

Item (f): comprises miscellaneous costs such as site preparation, data conversion and migration services for multimedia contents and application data, training of library staff and IT professional staff and start-up consumables.

Item (g): represents about 9% contingency on the cost items set out in Items (a) to (f).

Tentative Implementation Schedule of Major Upgrade of the MMIS

Activity	Target Completion
(a) Tender preparation and invitation	October 2009
(b) Tender evaluation, negotiation and award of contract	August 2010
(c) Implementation/Development of new MMIS	November 2011
(d) System Acceptance Test of new MMIS	February 2012
(e) Launch of new MMIS	June 2012