For discussion
on 5 July 2010

Legislative Council Panel on Financial Affairs

Implementation of System Infrastructure Enhancement Project for the Inland Revenue Department

PURPOSE

   This paper briefs Members on the proposed implementation of the System Infrastructure Enhancement (SIE) project for the Inland Revenue Department (IRD).

ENHANCEMENT OF SYSTEM INFRASTRUCTURE IN IRD

Background

2. At present, IRD maintains over 4.5 million tax files. Given the huge amount of tax data involved and to meet the increasing demand from the public, IRD attaches much importance to the strategic use of information technology (IT) to enhance the efficiency of its day-to-day operations and to provide a wide range of electronic services to the public.

3. The major components of IRD's existing IT infrastructure, which comprises the mainframe, midrange, personal computer (PC) and local area network (LAN) platforms, were implemented in 2000-2001. With technological advancement over the years, the IT infrastructure has become obsolete. As a result, there is an imminent need for enhancement so as to maintain a secure and reliable IT platform for IRD to fulfil its operational requirements effectively.

Constraints of the Existing IT Infrastructure

4. In 2009, IRD commissioned a technical study to review the existing IT infrastructure and to propose areas for enhancement in order to keep pace with the latest IT development and to support the changing business requirements of IRD. In short, the study has the following findings -

  (a) Constraints of the Existing Mainframe Platform

    IRD has been using the mainframe platform since 1980. The serviceable life of the existing mainframe machine is approaching its end. With technological advancement over the years, the mainframe platform has

also become obsolete. Related products and service support for the mainframe platform are rather limited in the market, rendering the recurrent maintenance cost for the platform and its applications much higher than that of other platforms.

There are various tax applications running on the mainframe platform to handle millions of tax returns and assessments. To meet the changing business needs over the years, there have been numerous ad hoc enhancements to the applications, which invariably affect the coherence among the applications and render the maintenance of and further enhancements to these applications to support new business needs increasingly difficult and costly. Besides, as mainframe applications are text-based, their user interfaces are not as user-friendly as web-based applications. There are also integration problems between the mainframe systems and the midrange systems.

All the above constraints call for the migration from the mainframe platform to an open standard platform, which is in line with the Government's overall IT trend.

(b) *Lack of Service Support for Outdated Software*

Currently, IRD is still using Windows 2000 as the operating system of desktop PCs. As service support for Windows 2000 will soon expire, there will no longer be fixes and security patches. The lack of service support for the LAN file servers and the Document Management System (DMS)[1] will also lead to maintenance problems. There is an imminent need to update the relevant software to newer version for which service support is available.

(c) *Emergence of Data Security Risks*

As a result of the afore-mentioned maintenance difficulties and lack of service support, IRD's IT infrastructure and applications may become vulnerable to security risks if no system enhancement is made in a timely manner. It is therefore imperative to upgrade the IT infrastructure to guard against possible leakage of taxpayers' data and forestall improper access to the data.

(d) *Limitations in Processing Chinese Characters*

The Chinese processing applications currently used by IRD have yet to conform to the prevailing standard (i.e. Unicode) both within the Government and among general computer users. Hence, exchange of

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[1] Implemented in 2003, the Document Management System allows IRD officers to have concurrent access to the electronic documents through the computer network and facilitates them to handle various tasks simultaneously.

Chinese data between IRD and other government agencies often requires labour-intensive code conversion process. Such limitation also affects the efficiency of electronic services for the public.

The Proposed SIE Project

5.   In the light of the above-mentioned constraints, the study has recommended the implementation of an SIE project. To avoid interruption to IRD's operations and its public services, the proposed SIE project is to be conducted in three stages. Details of the proposed project are as follows -

(a) *Stage I : File Server and Workstation Infrastructure Upgrade*

During this Stage, the operating system of all PCs will be upgraded with office automation software as well as various application software. The file server will be upgraded with enhanced shared network resources. New desktop management software will be installed for software management on the PCs. A centralised fax server will replace the existing isolated and scattered fax PCs. The Intranet will be redeveloped to allow knowledge-sharing among IRD officers with strengthened access control. It is expected that the upgrading will be completed by December 2012.

(b) *Stage II: DMS Upgrade*

At this Stage, the DMS comprising the servers, related PC workstations and scanners will be upgraded to enhance system capacity. It is expected that the upgrading will be completed by March 2013.

(c) *Stage III: Migration of Mainframe Applications to Midrange Platform*

At this Stage, a new midrange platform adopting open standard architecture and employing prevalent application development tools will be set up. Tax applications on the mainframe platform will then be migrated to the new midrange platform. During the process, one of the tax applications (i.e. the Property Tax System) will be redeveloped to cope with business requirements more efficiently. To cater for bulk printing requirements, there will be a new enterprise printing solution for flexible form design, output management, printing and generation of electronic documents. The Chinese processing applications will also be upgraded with a view to conforming to the Unicode standard. The migration and redevelopment will be conducted in two phases, with the first and the second phases expected to be completed by December 2015 and July 2016 respectively.

Benefits of the Proposed SIE Project

6.   The proposed SIE project could address the constraints of IRD's existing IT infrastructure as detailed in paragraph 4 above.   With the establishment of a more flexible and adaptable system architecture, the project will bring about the following benefits -

(a)   Enhanced Operational Efficiency and Business Capability

Through the use of advanced IT infrastructure and applications, IRD would not only be able to enhance work efficiency but also become better positioned to respond timely to changing operational needs in future, including introduction of additional e-services, and better equipped in exploring means to improve service quality.

(b)   Better System Integration

The migration of tax applications from the obsolete mainframe platform to the new midrange platform with standardised architecture would substantively improve the efficiency of integration and data sharing among different tax applications and systems.

(c)   Enhanced System Security and Risk Management

The upgraded IT infrastructure, with strengthened system security, would offer better protection of taxpayers' data kept by IRD.   There would also be a more reliable and secure environment for transactions of tax affairs.

(d)   Better Use of Departmental Resources

With the adoption of up-to-date technology, manpower demand for monitoring system performance and maintaining tax applications would dwindle, thus enabling staff re-deployment for other more gainful functions.   The replacement of the obsolete mainframe platform by the new midrange platform would also reduce the cost for maintaining the IT systems.

7.   The proposed SIE project has the support of the Office of the Government Chief Information Officer.

FINANCIAL IMPLICATIONS

Non-recurrent Expenditure

8.   It is estimated that the proposed SIE project would entail a total non-recurrent expenditure of $305.315 million over a seven-year period from 2010-11

to 2016-17. A detailed breakdown is at **Annex A**. In addition, the implementation of the project would incur non-recurrent staff costs of $93.334 million, which would be absorbed by IRD by internal staff re-deployment.

Recurrent Expenditure

9.   It is estimated that the proposed SIE project would incur recurrent expenditure of $10.767 million in a full year from 2016-17 onwards upon its full implementation, which would be absorbed by IRD within its existing resources. A breakdown is at **Annex B**.

Cost Savings/Avoidance

10.   We estimate that the implementation of the proposed project would enable IRD to avoid a substantial amount of expenditure for maintaining the existing IT infrastructure and ensuring continued smooth operation of the IT systems. The savings include the avoidance of a non-recurrent cost of $74.6 million that would otherwise be required on the upgrading of mainframe hardware and software as well as the redevelopment of the Property Tax System on the mainframe platform. If the IT infrastructure is not enhanced in a timely manner, IRD's day-to-day operations would be adversely affected and its capability of performing tax administration and revenue collection functions would be seriously jeopardised as the aged computer systems may pose higher risks of disruption to tax assessment programmes and delays in revenue collection.

11.   Moreover, the proposed project is expected to bring about annual savings of $10.345 million from 2016-17 onwards, comprising -

    (a)   *Realisable savings of $5.687 million*

        The savings in maintenance cost for the existing systems and equipment will be $16.454 million, part of which will offset the annual recurrent cost of $10.767 million arising from the proposed project as set out in paragraph 9 above. The net recurrent annual savings from the proposed project would therefore be $5.687 million.

    (b)   *Notional savings of $2.939 million*

        These represent fragmented staff cost savings from productivity gain as a result of more efficient operations brought about by the proposed project as well as reduced demand for IT support and maintenance from the new systems. They cannot be realised by deletion of posts given that they spread over various application systems but will be deployed to cover other minor enhancements that may arise in future.

(c)   Cost avoidance of $1.719 million

This represents the avoidance of additional hardware and software maintenance costs, which would otherwise be required to support the upgrading of the obsolete mainframe system.

IMPLEMENTATION PLAN

12.   As stated in paragraph 5 above, we plan to implement the proposed SIE project in three stages and expect that the entire project will be completed by July 2016. A detailed implementation plan is at **Annex C**.

ADVICE SOUGHT

13.   Subject to Members' views, we plan to seek funding approval from the Finance Committee by end 2010.

Financial Services and the Treasury Bureau
June 2010

Non-recurrent Expenditure of the Proposed SIE Project

	2010-11 $'000	2011-12 $'000	2012-13 $'000	2013-14 $'000	2014-15 $'000	2015-16 $'000	2016-17 $'000	Total $'000
(a) Hardware	-	22,395	17,319	-	-	-	-	39,714
(b) Software	-	39,267	13,057	-	-	-	-	52,324
(c) Communication line	-	116	116	-	-	-	-	232
(d) Implementation services	3,960	18,077	25,978	32,421	48,478	15,436	-	144,350
(e) Contract staff	707	4,931	6,602	8,177	15,285	6,880	292	42,874
(f) Site preparation	-	144	3,653	5	-	-	-	3,802
(g) Training	465	1,970	1,022	310	433	133	-	4,333
(h) Consumables and miscellaneous	40	252	330	328	485	155	-	1,590
(i) Accommodation cost	35	220	319	360	452	170	-	1,556
(j) Contingency	260	4,369	3,420	2,080	3,257	1,139	15	14,540
Total	**5,467**	**91,741**	**71,816**	**43,681**	**68,390**	**23,913**	**307**	**305,315**

Recurrent Expenditure of the Proposed SIE Project

	2013-14	**2014-15**	**2015-16**	**2016-17 and onwards**
	$'000	**$'000**	**$'000**	**$'000**
(a) Hardware and software maintenance	186	4,028	4,419	8,844
(b) On-going system support services	164	1,364	1,364	1,364
(c) Communication line	116	116	116	116
(d) Consumables and miscellaneous	10	202	221	443
Total	**476**	**5,710**	**6,120**	**10,767**

Implementation Plan for the Proposed SIE Project

Activity	Target Completion Date

I. File server and workstation infrastructure upgrade

(a) Procurement	March 2012
(b) System analysis and design	March 2012
(c) System development	June 2012
(d) User acceptance	December 2012
(e) System live-run	December 2012

II. DMS upgrade

(a) Procurement	November 2011
(b) System analysis and design	February 2012
(c) System development	August 2012
(d) User acceptance	November 2012
(e) Data conversion	January 2013
(f) System live-run	March 2013
(g) System nursing	June 2013

III. Migration of mainframe applications to midrange platform

(a) Procurement	March 2012
(b) System analysis and design	January 2013
(c) Data conversion and rehearsal	December 2015
(d) System development	June 2016
(e) User acceptance	June 2016
(f) System live-run	December 2015 (Phase 1)
	July 2016 (Phase 2)
(g) System nursing	January 2017