For discussion
on 10 February 2011

Legislative Council Panel on Security

Implementation of a New Generation Operations Department Information System of the Independent Commission Against Corruption

PURPOSE

This paper seeks Members' support on the proposal to replace the existing Operations Department Information System (OPSIS) by a new generation OPSIS with a view to enhancing the information technology (IT) capability of the Independent Commission Against Corruption (ICAC) to support investigation management of its Operations Department (OPS).

BACKGROUND

2. The OPS is the investigative arm of the ICAC. It is responsible for receiving, considering and investigating alleged corruption and related offences. OPSIS is the mission-critical information system of the OPS, supporting the entire investigation cycle including, but not limited to, complaint receiving, case management, court case management, investigation case closure, and statistical compilation and reporting. At present OPSIS supports around 700 users.

3. The existing OPSIS was developed in 1998 and launched in 2000. The OPSIS has remained reliable but its architecture and design has become increasingly inflexible to cope with growing complexity of investigations. Changes in legislations and operational needs have created a further strain on the efficiency and effectiveness of the OPSIS in providing its necessary support to investigating officers. To cope with these changes, a number of piecemeal system enhancements were made to the OPSIS in the past 10 years. In addition, six independent administrative IT systems were built to support various operational requirements. Owing to different architectural designs, duplicated efforts are required for data input and maintenance in these various systems and a comprehensive data analysis cannot be conducted efficiently. To overcome these problems, it is necessary for the ICAC to redevelop the OPSIS with a view to enhancing its support to the entire investigation process and case management.

NEEDS TO REPLACE THE EXISTING SYSTEM

4. Nowadays criminals are quick to exploit IT and sophisticated financial tools to facilitate their illicit activities. This, coupled with globalization means that the ICAC has to face increasing challenges in investigation corruption and related crimes which have become increasingly complex in nature. To enhance ICAC's investigation capacity, the existing OPSIS has to be improved in the following areas –

(a) Data correlation and analysis

In the process of investigation, investigating officers spend much time in correlating relationship of different subjects. Relationships among criminals are however getting more indirect nowadays, and intensive effort is required to uncover their relationships and to collect evidence to prove their corrupt and related criminal activities. The existing OPSIS has to be modernised before it can provide the required analytical tool to assist investigating officers to effectively conduct analysis to identify the correlated information. At present, officers have to conduct multiple rounds of analysis to review and detect crime patterns manually before the relationships of different objects and events can be revealed.

(b) Search engine

The existing OPSIS was designed to address the requirements of the last decade, and does not provide an effective search engine for investigating officers to retrieve case information. Officers have to conduct multiple rounds of checking and refer to different systems used in the investigation cycle for retrieving the required information. These data searching processes are labour intensive and hinder our operational efficiency.

(c) Interoperability between the existing OPSIS and other IT systems

The existing OPSIS and the other six separate and independent administrative IT systems were built at different times. The data structure of the existing OPSIS and the other six separate independent administrative IT systems were not designed to handle multi-dimensional enquiries. Their different architectures, application components and input interface have led to data being stored in different formats in the systems, resulting in difficulties for subsequent data processing, retrieval and analysis. The outdated architecture and design have imposed serious constraints on usability, data interoperability and administration effectiveness among the

existing OPSIS and the six separate administrative IT systems, thus leading to redundant workflow and data entry, costly application programme enhancements and service interruptions to all OPSIS users when installing the enhanced application programmes. These problems have resulted in operational inefficiency and support service ineffectiveness.

(d) Reporting tools

The reporting tools in the existing OPSIS cannot collect and consolidate data from the six separate administrative IT systems for aggregated processing. Data such as accounting and financial records, asset tracing and fund flow, etc., obtained during the course of investigation cannot be readily incorporated into the system electronically. Long lead time is required to extract data from multiple sources and then transform them into the required format for further analysis and correlation with a view to uncovering and matching suspicious patterns.

(e) Maintenance

The existing OPSIS was built on architecture and technologies of the last decade which are outdated in the prevailing IT market. Thus, the ICAC has experienced increasing difficulties in sourcing service providers or personnel with the required skills for maintaining or enhancing the existing OPSIS for meeting new operational requirements. Staff also need to make extra effort in acquiring different skill sets and technologies to maintain the existing OPSIS and the other six independent administrative IT systems.

PROPOSAL

5. With the support of the Government Chief Information Officer, the ICAC proposes to replace the existing OPSIS by implementing a new generation OPSIS with a view to consolidating and providing integrated and enhanced system facilities. The new OPSIS will ride on the necessary architecture and technology to support the development of customized application components covering the entire investigation cycle as well as enhancing the IT capability to support investigation management. Modern tools for data analysis and enhanced search technology will be provided. The investigation data taxonomy will be standardized and the data structure will be redesigned. The new OPSIS will also incorporate core functions and features of the other six separate administrative IT systems with enhanced security and service availability. The six separate

administrative systems, together with the existing OPSIS, will be dispensed with upon implementation of the new system.

Anticipated Benefits of the Proposed System

6. The new OPSIS will take advantage of the latest technologies and ride on a new design of system architecture and data model. It will address the existing constraints and enhance its capabilities to support investigation management through –

(a) Improved case data correlation and analysis capability

A modern data analysis tool will be provided for investigating officers to enhance their efficiency and effectiveness in analyzing data, such as accounting and financial records, asset tracing, fund flows, etc. A data mining tool which has improved capacity in handling voluminous data will be introduced. Suspicious and matching patterns can be uncovered and extracted automatically. A more advanced visual tool will also be provided to visualize relationships of selected objects in required formats in order to give investigating officers a complete and clear overview of the situation.

(b) Enhanced searching efficiency

The core functions and features of the existing OPSIS and the other six separate administrative IT systems will be incorporated into one single entity. These six separate administrative systems, together with the existing OPSIS, will be dispensed with upon implementation of the new system. The new OPSIS will enable real time processing and data synchronization across different subsystems. Investigating officers only need to log on to a single system to access a consolidated view of all the information of a case. System administration and maintenance effectiveness can also be enhanced with one single system environment to be maintained. The enhanced search technology will be included in the new OPSIS to support free text search and document search with sophisticated sorting and filtering capabilities. Through the use of modern search technology, relevant information can be retrieved and presented effectively according to the criteria defined by users to fulfil their investigation duties.

(c) Improved overall operational efficiency by implementation of business process re-engineering (BPR) opportunities

A BPR study was conducted in 2010 and had identified opportunities to improve the effort required in processing investigation data. High-speed scanning solution and effective document management functions will be deployed for the preparation of documentary exhibit bundles to replace the existing error-prone and tedious photocopying, indexing, paginating, and document sorting processes and will reduce the production time by at least 50%. More advanced features will be introduced to enhance the efficiency and effectiveness in recording the movements of case properties and files, etc.

(d) Standardized investigation data taxonomy and enhanced data structure

The new OPSIS design will support standardization of investigation data taxonomy and the data structure will be redesigned. System data will be better organized for more effective maintenance and enquiry. Input validation features will be enhanced and comprehensive pre-defined list will be provided for various input fields. More investigation related forms will be provided with automatic data filling feature thereby minimizing duplicated effort in data entry.

(e) Enhanced reporting tools

The new OPSIS and the underlying statistical database will be re-designed to enhance the flexibility for the generation of investigation and statistical reports. "What-if" analysis involving multiple reporting criteria will be introduced using advanced reporting tools, thus improving efficiency and effectiveness in generating reports.

(f) Updated technology and enhanced security and service availability

The ICAC has stringent control over data security and system security with necessary access control, audit trail and encryption features implemented in the existing OPSIS. The new OPSIS will be further equipped with enhanced information security features. For example, authentication using ICAC warrant card / staff card will be imposed to restrict access to selected functions where appropriate. More advanced firewall will be implemented for safeguarding the new OPSIS from unauthorized access. Load

balancing equipment will also be employed to improve the resilience level of the system. Furthermore, risk assessments of the new OPSIS will be conducted to ensure appropriate measures are in place regarding authenticity, integrity, confidential and non-repudiation of the access to and use of information as well as the protection of personal data from unauthorised or accidental access, processing, erasure or other use. By leveraging the latest technologies, the new OPSIS will have the capability and flexibility to cope with further enhancements and changes when such needs arise in future.

FINANCIAL IMPLICATIONS

Non-recurrent Expenditure

7. We estimate that the implementation of the new OPSIS will require a non-recurrent cost of $57,457,000 over a four-year period from 2011-12 to 2014-15, with breakdown as follows –

		2011-12 $'000	**2012-13 $'000**	**2013-14 $'000**	**2014-15 $'000**	**Total $'000**
(a)	Hardware	0	2,037	6,967	0	**9,004**
(b)	Software	0	2,598	7,784	0	**10,382**
(c)	Implementation services	2,422	9,687	9,860	10,667	**32,636**
(d)	Site preparation	0	27	101	0	**128**
(e)	Consumables and miscellaneous	0	14	55	15	**84**
(f)	Contingency	242	1,436	2,477	1,068	**5,223**
	Total	**2,664**	**15,799**	**27,244**	**11,750**	**57,457**

8. In addition, the implementation of the project will entail a non-recurrent staff cost of $6,897,000. The ICAC will absorb the non-recurrent staff cost through internal re-deployment of its existing resources.

Recurrent Expenditure

9. We estimate that the annual recurrent expenditure for the proposed system is $8,978,000 in a full year from 2017-18 onwards, with breakdown as follows –

		2017-18 and onwards $'000
(a)	Hardware Maintenance	1,570
(b)	Software Maintenance	1,826
(c)	On-going system support and maintenance	5,523
(d)	Consumables and miscellaneous	59
	Total	**8,978**

10. The ICAC will absorb the annual recurrent expenditure of the proposed system.

Cost Savings / Avoidance

11. We estimate that the successful implementation of the new OPSIS will result in annual savings of $11,368,000 a year, with breakdown as follows –

(a) realisable savings of $6,838,000 a year, being the maintenance cost of the existing OPSIS. The savings will be used to cover part of the recurrent cost of the new OPSIS; and

(b) net notional savings of $4,530,000 a year, mainly due to savings in staff cost of the Commission Against Corruption grade officers through the implementation of the BPR opportunities. The notional savings will be redeployed to undertake other duties in OPS.

12. We estimate that the implementation of the new OPSIS will also bring about a one-off cost avoidance of $35,681,000 which will be required for integrating the existing OPSIS and the six separate administrative IT systems, procuring additional hardware as well as implementing the outstanding application backlog if the existing OPSIS is not replaced.

IMPLEMENTATION PLAN

13. Subject to Members' view, we plan to seek funding approval from the Finance Committee with a view to implementing the new OPSIS according to the following schedule –

	Activity	**Target completion date**
(a)	Tender preparation, tendering and award of contract	January 2012
(b)	System analysis and design	May 2012
(c)	System development and testing	July 2013
(d)	User acceptance test	December 2013
(e)	System installation	February 2014
(f)	System rollout and migration	August 2014

ADVICE SOUGHT

14. Subject to Members' views on the proposal, funding approval will be sought from the Finance Committee in May 2011.

Independent Commission Against Corruption
February 2011