For Discussion
on 1 March 2016

Legislative Council Panel on Security

Replacement of Core Information Technology Systems with the Integrated Custodial and Rehabilitation Management System for the Correctional Services Department

PURPOSE

This paper seeks Members' support for the proposal of replacing the core information technology (IT) systems with an Integrated Custodial and Rehabilitation Management System (iCRMS) for the Correctional Services Department (CSD) to meet its evolving operational and IT needs.

BACKGROUND

2. Since the 1990s, CSD has adopted IT systems to support its day-to-day operations. Envisaging the need for a long-term IT strategy to support its operational development and objectives, CSD engaged an external consultant in 2012 to conduct an Information Systems Strategy Study (ISSS). The first Information Systems Strategy Plan (ISSP) was developed in 2013, introducing a five-year strategic roadmap for IT systems development in CSD.

3. Following the recommendations of the ISSP, CSD completed feasibility studies on the proposed iCRMS and IT Infrastructure Upgrade in 2015. The feasibility studies recommended that the existing eight core operational systems of CSD[1] should be replaced by an enhanced, integrated system, *viz.* the iCRMS. The studies also recommended that the existing data centre be enhanced to host the proposed iCRMS, and that the network coverage in all correctional institutions be extended so as to cater for the implementation of iCRMS and the long-term business needs of CSD.

[1] The eight systems include the Penal Record Information System (PRIS); the Rehabilitation Programmes Management System (RPMS); the Tracking and Recording System of Urine Test (TRUT); the Inmate Mail Information System (IMIS); the Security Intelligence Management System (SIMS); the Drug Management System (DMS); the Automatic Fingerprint Identification System (AFIS); and the Patrol Management System (PMS).

THE PROPOSAL

4. CSD proposes to replace the existing eight core operational systems with an iCRMS on an upgraded IT infrastructure with the latest technology to address the limitations of the existing systems and provide new and enhanced features.

JUSTIFICATIONS

End of Serviceable Life Span of the Existing Core Operational Systems

5. CSD's existing custodial and rehabilitation operations are supported by the eight core operational systems, which play a pivotal role in supporting the operations of CSD. Among these systems, the Penal Record Information System (PRIS) is the mission-critical system developed in 1994 for record-keeping on a client-server based architecture, which enables correctional institutions and the CSD Headquarters to access the details of persons in custody (PICs) on admission, custodial activities, transfer, discharge, etc. The rest were supplementary systems developed at different points in time since 2002 to meet specific operational needs.

6. Launched in phases since 1994, the existing eight core operational systems will approach the end of their serviceable life span from 2018 to 2022. They are facing the risks of lacking maintenance services if system replacement could not take place in time. It is difficult to secure maintenance services for the ageing hardware and software. Without proper on-going maintenance and technical support, the overall system reliability would be hampered and the day-to-day core operations in correctional institutions would be disrupted consequently. Taking into account the lead time required for the development of the proposed iCRMS which will replace the existing eight core operational systems with enhancements, it is considered necessary to commence the implementation of the proposed integrated system in 2016.

Need for and Advantage of an Integrated System

Constraint on Data Sharing on the Existing Systems

7. Although CSD could at present maintain an effective, stable and secure correctional environment, it is faced with a growing trend of associated security risks stemming from the increasing sophistication and complexity of disciplinary breaches by PICs. There are imminent operational needs for more comprehensive and closer custodial monitoring / management and diversified rehabilitation programmes.

8. Whilst the mission-critical PRIS has had system hardware and software upgrades for operational continuity, the overall system design and architecture of PRIS remains largely the same without major enhancements over the past two decades, resulting in constraints on data sharing between PRIS and the supplementary systems. For example, the timely retrieval of accurate and comprehensive PICs' information is vital in the detection, handling and investigation of various incidents, from minor PICs dispute / fighting cases to mass collective misbehaviour incidents such as strikes, mass food refusal / indiscipline. Given that the existing silo systems have limited data sharing capability and the information is scattered in different systems, it is not conducive to effective data retrievals for comprehensive analysis in a hectic situation and could cause unnecessary delay in response and decision making where the consequences might be detrimental.

Holistic Information for Better Strategic Planning and Services

9. The iCRMS, which integrates the eight systems into one single platform, would provide a holistic view of PIC's information to facilitate operational planning as well as rehabilitation services.

10. With the custodial and rehabilitation records of PICs accumulated in the iCRMS, comprehensive profiles could be developed which would provide a holistic view on PICs' background and performance. Having a centralised data repository in place and adopting business intelligence tool, data could be analysed more effectively by means of timely and accurate retrievals of data. This could facilitate better service planning and policy implementation. The comprehensive PICs' information in iCRMS will facilitate CSD's analysis on the trend of PICs' distribution according to their background, such as age groups, offence types and triad affiliations, thus enhancing the effectiveness in the policy planning of future placement of PICs in different types of correctional facilities with respect to the functions and security levels.

11. With a holistic account of PICs' characteristics, the penal management will be better equipped to assess the risks and needs of the PICs and be able to develop thorough security measures based on the analysis. For example, the holistic information of PICs will facilitate the tailoring of suitable vocational training, education and rehabilitation programmes to aid PICs' reintegration into the society. Moreover, every piece of information including PIC's personal behaviour, violent history and escape tendency in the past will contribute to the management's proactive assessment on any vulnerable spots within the institutions so that preventive actions can be taken to defuse the situations before any untoward incident occurred.

Streamlining the Operations with New Functions

12. In addition to streamlining the existing functions of the core operational systems through integration, iCRMS can support new functions such as muster count and tracking of movements of PICs in different areas of a correctional institution; management of PICs' schedules including escort management, allocation of work and vocational training; electronic visit booking service and electronic recording of hand-in articles provided by visitors; keys and equipment management; and management of urine tests for supervisees. These new functions support the penal management's security surveillance capability and also streamline the operational process to enhance efficiency.

Supporting Security Surveillance

13. Currently, for identification purpose, each PIC is assigned a PIC card upon admission. With the iCRMS in place, the PIC card will be embedded with a passive Radio Frequency Identification (RFID) chip. While the personal information will remain to be printed on the face of the card, the RFID chip will hold a serial number in encrypted format. PICs will present their cards during most of their daily custodial activities to CSD staff for scanning on designated mobile devices with RFID readers to read the serial number in a contactless manner. The mobile devices will then indicate whether the PICs are authorised to access certain locations after validation and their access information will be recorded electronically.

14. It is a matter of high security concern that PICs who have the potential to collaborate for illicit activities or come into conflicts might try to communicate with each other within an institution. The electronic movement records, such as where, when and for what purposes PICs are

moved, will be conducive to the detection of any illicit activities. Moreover, movement of PICs would be controlled more effectively by scanning their RFID cards on mobile devices. The electronic movement records also enable Control Rooms in institutions to have holistic knowledge on the movements of the PICs, and facilitate planning by the Control Rooms for mass movements of PICs. This will enhance penal management's capability in security surveillance.

Streamlining the Operational Process for Higher Efficiency

15. With the new functions in place, the overall work efficiency would be enhanced through automation of the streamlined procedures. For example, when performing muster count at institutions, currently operational staff have to go around the entire institution at pre-defined intervals to collect muster chits of various locations. The electronic movement records will largely relieve the staff from this duty. In addition, the introduction of electronic calendars with built-in PIC's schedule could assist in better co-ordination on PIC's activities, and enhance efficiency in facilitating PICs' family members to book visits via an e-booking platform.

Need for more Capacity in IT Infrastructure

16. The existing network and systems infrastructure of CSD was set up in the 1990s. The capacity of the data centre has already reached its maximum that it is not able to meet the development needs of CSD in the long run, including the implementation of the iCRMS. It is therefore proposed that the existing data centre should be enhanced with capability and capacity to host the proposed iCRMS.

FINANCIAL IMPLICATIONS

Capital Expenditure

17. It is estimated that the implementation of the proposed iCRMS project will incur a total capital expenditure of $352,754,000 over seven financial years from 2016-17 to 2022-23. The breakdown is as follows –

Items	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	Total
				($ 000)				
(a) Hardware	-	12,504	12,708	15,782	32,182	9,290	-	82,466
(b) Software	-	871	10,658	21,463	9,381	1,124	-	43,497
(c) Implementation services	-	4,314	20,760	25,106	25,745	25,985	8,560	110,470
(d) Contract staff	505	3,815	5,008	5,208	5,417	5,633	1,914	27,500
(e) Site preparation	-	4,717	10,185	13,125	15,929	8,418	1,415	53,789
(f) Communication lines	-	275	276	184	205	54	-	994
(g) Consumables	-	-	17	65	172	51	-	305
(h) Training	-	-	-	-	1,248	416	-	1,664
(i) Contingency	51	2,650	5,961	8,093	9,028	5,097	1,189	32,069
Total	**556**	**29,146**	**65,573**	**89,026**	**99,307**	**56,068**	**13,078**	**352,754**

Other Non-recurrent Expenditure

18. The implementation of the proposed iCRMS project will require the formation of a project team which comprises members of IT staff and user representatives. The project team will be responsible for IT project management and implementation support such as tendering, provision of user requirements, site preparation, system integration tests, user acceptance tests, verification of converted data, end-user support during the system rollout. This will entail a non-recurrent staff cost of some $84 million from 2016-17 to 2022-23.

Recurrent Expenditure

19. The proposal is estimated to incur an annual recurrent expenditure of $48.27 million from 2023-24 and onwards. CSD will absorb such requirement from its existing resources. The breakdown is as follows –

Items	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24 onwards
			($ million)				
(a) Hardware maintenance	-	3.15	4.74	5.41	7.35	8.22	13.06
(b) Software maintenance	-	0.05	2.44	3.46	7.42	8.09	8.09
(c) On-going system support services	-	-	-	-	-	6.23	9.34
(d) Hosting services	-	2.19	2.92	2.92	2.92	2.92	2.92
(e) Communication services	2.47	4.85	5.44	6.63	6.63	6.63	6.63
(f) Consumables	-	-	-	-	0.01	0.23	0.23
(g) Staff cost	-	-	-	-	-	7.33	8.00
Total	**2.47**	**10.24**	**15.54**	**18.42**	**24.33**	**39.65**	**48.27**

Savings and Cost Avoidance

20. We estimate that the implementation of the proposed iCRMS project will bring about the following savings and cost avoidance –

(a) **Non-recurrent cost avoidance** of $157.81 million in 2017-18 to 2020-21, being the cost required to upgrade the existing eight core operational systems in order to sustain the current business operations;

(b) **Recurrent cost avoidance** of $7.01 million from 2021-22 onwards, being an additional recurrent cost required for the maintenance of the upgraded systems mentioned in item (a) above;

(c) **Recurrent realisable savings** of $8.83 million from 2022-23 onwards, being the annual maintenance and support cost of the existing core operational systems. The savings will be ploughed back to offset part of the recurrent expenditure of the proposed iCRMS; and

(d) **Recurrent notional savings** of $43.99 million from 2022-23 onwards, being the annual notional staff savings and savings achieved by efficiency gain through streamlined operational processes, such as keys and equipment management, internal movement control and submission of muster counts. The notional staff savings are fragmented in nature and will be redeployed among 29 institutions to strengthen custodial and rehabilitation work.

IMPLEMENTATION PLAN

21. Subject to Members' comments on the proposal, we plan to seek funding approval from the Finance Committee as soon as possible. If the funding approval can be obtained in the second quarter of 2016, we plan to implement the proposed system according to the following schedule –

	Activity	Target Date
(a)	Tendering	
	- Preparation of tendering documents	Jun 2016 – Oct 2016
	- Tendering procedures	Nov 2016 – Jul 2017
	- Award of contract	Aug 2017
(b)	Systems Analysis and Design	Sep 2017 – Dec 2018
(c)	Phase I	
	- System development[2]	Oct 2018 – Mar 2020
	- Site preparation	Oct 2018 – Jun 2021
	- User acceptance test and data migration	Apr 2020 – Aug 2020
	- Rollout	Sep 2020 – Jun 2021
(d)	Phase II	
	- System development[2]	Sep 2020 – Aug 2021
	- Site preparation	Sep 2020 – Feb 2022
	- User acceptance test and data migration	Sep 2021 – Nov 2021
	- Rollout	Dec 2021 – Feb 2022
(e)	System Nursing	Mar 2022 – Aug 2022
(f)	Project Completion	Sep 2022

ADVICE SOUGHT

22. Members' views are invited on the above proposal and our plan to seek funding approval from the Finance Committee.

Security Bureau
Correctional Services Department
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[2] System development consists of application development, system installation, Security Risk Assessment and Audit (SRAA), Privacy Impact Assessment (PIA) and system integration tests.