ITEM FOR FINANCE COMMITTEE

CAPITAL WORKS RESERVE FUND
HEAD 710 – COMPUTERISATION
Education Department
New Subhead "Infrastructure Enhancement Project
for Schools and the Education Department"

>   Members are invited to approve a new commitment of
> $376 million for enhancing the administrative computer
> systems in public sector schools[1], local schools under
> the Direct Subsidy Scheme, and the Education
> Department.

PROBLEM

        The administrative computer systems in schools and in the
Education Department (ED) are outdated. They allow only limited access, and are
not efficient enough to meet increasing users' expectations and needs. The lack of
integration between the different systems has also constrained effective deployment
of information technology (IT) resources.

PROPOSAL

2.   With the support of the Secretary for Education and Manpower
and on the advice of the Director of Information Technology Services, the Director
of Education proposes to create a new commitment of $376 million to –

>   (a)   replace and upgrade computers of the School Administration and
>   Management System (SAMS);
>
>   (b)   integrate the SAMS network and the computers in schools provided
>   for IT in education;

/(c) .....

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[1]   Public sector schools refer to Government, aided and caput schools.

     (c)   convert the SAMS into a web-based application;

     (d)   replace and upgrade computers of the Education Department Information System (EDIS); and

     (e)   expand the coverage of users of the EDIS.

3.   The proposed enhancement to the school administrative computer system will cover both public sector schools and local schools under the Direct Subsidy Scheme (DSS), as we also allow the latter to access SAMS facilities at present.

JUSTIFICATION

4.   Both the SAMS and the EDIS are administrative computer systems launched in 1994. With the rapid development in IT, the systems are now lagging behind the latest technology to meet increasing users' expectations and needs.

Replacing and upgrading computers of the SAMS

5.   Since the implementation of the IT in education strategy in November 1998[2] and the rolling out of various initiatives, an IT culture is gradually building up in schools. Teachers are now more accustomed to using computers. As a result, the usage rate of the SAMS is on the increase. For example, some 90% of public sector schools now send student data to the ED electronically through the SAMS and about 80% of secondary schools use the system to send students' registration details for entries to public examinations to the Hong Kong Examinations Authority, as compared with 30% and 40% respectively in 1997.

6.   While it is encouraging to note the increasing use of the SAMS, we have also been receiving feedback from teachers and schools that the processing speed of the SAMS is too slow. Indeed, due to the rapid development in IT, the processing power and the storage capacity of the SAMS, which was based on the standards in 1994, can no longer meet present day users' requirements. To better serve the users and to improve the efficiency of the system, there is a clear need to replace and upgrade the computers of the SAMS.

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[2]   We issued a strategy document entitled "Information Technology for Learning in a New Era: Five-year Strategy 1998/99 to 2002/03" in November 1998 after public consultation. A capital sum of $3,200 million and a recurrent sum of $560 million were set aside for implementing the various initiatives in the strategy document.

7.   We will provide a series of support services to schools to run the enhanced SAMS, including visits and on-site advice to schools, enquiry hotline, security audit and technical support services. However, we do not consider it necessary to provide any additional staff to schools to support the improved system. First, the enhanced SAMS will not give rise to any additional administrative work. Rather, it serves to improve efficiency of the current system and will in turn save the time and efforts spent by school teachers and staff in handling administrative work. Secondly, we have already been providing schools with additional clerical support in recent years[3]. Together with the introduction of the operating expenses block grant starting from the 2000/01 school year, schools should have enough resources and enough flexibility to deploy these resources to operate the new system.

Integrating the SAMS network and computers in schools provided for IT in education

8.   At present, each school is, on average, provided with four computers under the SAMS. In addition, each primary and secondary school is, on average, provided with 40 and 82 computers respectively for implementing IT in education. Due to hardware and network constraints, however, the two types of computers cannot be used interchangeably. As a result, there may be times when the demand for one network is high whilst the computers for the other are not fully engaged, and yet schools cannot deploy resources from one network to another. For example, the demand for the SAMS is usually high during the period after year-end examinations as teachers have to input students' scores, while there is spare capacity for computers designated for use of IT in education during that time as there are no school lessons. Through integrating the SAMS and computers provided for IT in education, schools can pool all IT resources available in schools together and put them to optimal use for both administrative work and teaching and learning activities.

Converting the SAMS into a web-based application

9.   Web technology is now more commonly used in developing software. However, the processing power and the storage capacity of the existing SAMS do not allow us to tap this technological advancement in an effective and efficient manner. Converting the SAMS into a web-based application will bring about the following benefits -

/(a) .....

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[3]   The Government has provided additional clerical staff for secondary and primary schools in recent years to help teachers cope with their clerical work. For example, about 930 additional clerical staff are being provided to primary and secondary schools over three years starting from the 1998/99 school year. In addition, starting from the 1999/2000 school year, the Government provides an annual supplementary grant of $120,000 for each primary school and $155,000 for each secondary school to help schools handle administrative work.

      (a)   teachers can access the SAMS anywhere and anytime as long as they have computers connected to the Internet;

      (b)   it will be much easier to upgrade the SAMS in future. At present, upgrading the SAMS software requires a lot of manpower as the ED needs to install the new software school by school, and there are over 1 000 schools installed with the SAMS. With the enhanced SAMS, the ED will only need to upgrade the programme once at the ED's server, and schools can immediately download the upgraded version through the Internet; and

      (c)   the web provides a convenient platform for software developers to promote and develop add-on school administrative software, thus providing schools with easier access to more choices on such software.

10.   Since the SAMS contains students' personal information, there is a need to put in place security measures such as password identification and network traffic filtering devices after going web, and integrating the IT in education network and the SAMS network so that unauthorized access to the SAMS will not be allowed.

Replacing and upgrading computers of the EDIS

11.   The rapid development in IT provides an excellent opportunity for Government departments to improve their services to the public. At present, the public can communicate with officers of the ED through the EDIS which is connected to the Internet. However, computers of the EDIS are aging and its system capacity is insufficient to support a large amount of public requests made electronically. To enable the ED to provide better customer service and to start implementing the delivery of its services on-line through the Internet, there is a need to upgrade the computers, software and network equipment of the EDIS.

Expanding the coverage of users of the EDIS

12.   Apart from aging computers and insufficient system capacity of the EDIS, provision of services on-line by the ED is also constrained by the limited access of ED officers to the EDIS and the Internet. The EDIS network currently only covers around 1 300 ED officers, mostly officers of the rank of Education Officer (or equivalent) or above. Under such an arrangement, senior officers cannot communicate with their staff direct electronically. More importantly, many frontline staff who deal with public requests direct do not have computers or

computers which are connected to the EDIS network and the Internet. To improve both internal and external communication, there is a need to extend the network coverage of the EDIS and the Internet to all officers of the rank of Assistant Education Officer (or equivalent) or above. By networking existing stand-alone computers in the ED and providing about 140 additional computers, some 1 800 ED officers will be able to use the EDIS network in their daily work.

Cost and Benefit Analysis

13.　　　　　Implementation of the proposed enhancement project will bring about notional staff savings estimated at $223 million in schools and the ED. These benefits cannot be realised in cash terms as the staff savings are fragmented. Given the wide scope of tasks which the SAMS and EDIS handle, all tasks currently performed by the two systems will be handled more efficiently. The time and efforts of teachers and ED staff can be diverted to more useful work, thus bringing about enhanced productivity and leading to better customer services.

Encl. 1　14.　　　　　A detailed cost and benefit analysis is at Enclosure 1. We anticipate that the system will break even in 2003-04.

FINANCIAL IMPLICATIONS

Non-recurrent cost

15.　　　　　We estimate that the proposal will incur a total non-recurrent expenditure of $376 million over three years from 2000-01 to 2002-03. Details of the non-recurrent expenditure and the estimated cashflow are as follows –

		2000-01 $'000	2001-02 $'000	2002-03 $'000	Total $'000
(a)	Procuring upgraded and additional SAMS computers	23,126	81,962	146,816	251,904
(b)	Integrating the SAMS network and the IT in education network	0	2,739	20,142	22,881
(c)	Converting the SAMS into a web-based application	0	23,337	17,931	41,268

/(d) .....

		2000-01 $'000	2001-02 $'000	2002-03 $'000	Total $'000
(d)	Upgrading computers and system of the EDIS and expanding its coverage	861	31,070	28,002	59,933
	Total	**23,987**	**139,108**	**212,891**	**375,986**

16.   As regards paragraph 15(a), the expenditure is for the acquisition of about 1 250 servers and 4 900 workstations for the SAMS, other ancillary equipment, related installation services and training for about 3 800 teachers for the SAMS.

17.   As regards paragraph 15(b), the expenditure is for the procurement of network traffic filtering devices and for site preparation works for installing trunking and power points, and cabling work at around 1 200 schools. As all schools have already installed trunking and cables under the IT in education project, integration of the SAMS and computers provided for IT in education can be achieved with some minimal site preparation works.

18.   As regards paragraph 15(c), the expenditure is for the acquisition of contractual services and necessary software to convert the SAMS into a web-based application.

19.   As regards paragraph 15(d), the expenditure is for the acquisition of about 60 servers and 140 workstations, network hardware, communication lines, security devices, related implementation services for the EDIS and training for about 1 800 ED staff.

Recurrent cost

20.   We estimate that the additional annual recurrent cost for hardware and software maintenance for the upgraded and replaced items, and the additional consumables and technical support services for the enhancement project will be around $18 million. Details of the estimate are set out in Enclosure 2. This expenditure will be met from ED's existing resources.

Encl. 2

/Implementation .....

Implementation plan

21.   In view of the large number of public sector schools (about 1 200 schools), we see a need to give greater flexibility to schools in the replacement and upgrading of computers of the SAMS and it is not necessary for all the work to be done centrally by the Government. While some schools may urgently need replacement of aging machines, others may wish to replace the system later due to other priorities. To better facilitate schools to decide on their own when to arrange site preparation works and replace computers, they will have the options of receiving cash grants from the Government for the procurement of equipment only, or for both the procurement of equipment and conducting site preparation works. Our estimate is that the average amount of cash grant for procurement of computer hardware and software for the SAMS and for conducting site preparation works for each school is about $177,000 and $49,000 respectively. Alternatively, schools can ask the Government to buy the equipment and/or carry out the site preparation works on their behalf.

22.   As regards DSS schools, they will receive a cash grant to procure the computer equipment and to arrange site preparation works on their own. The amount of cash grants will be the same as those for their public sector counterparts.

23.   We plan to commence the upgrading of the SAMS in October 2000 for completion in August 2002, while works on the conversion of the SAMS into a web-based application will be completed in October 2002. The enhancement to the EDIS will commence in November 2001 for completion by June 2002. A detailed implementation plan is at Enclosure 3.

Encl. 3

BACKGROUND INFORMATION

24.   In 1993, the Finance Committee approved the implementation of an Information Systems Strategy [FCR(93-94)78] to maximise the effective utilisation of resources through the introduction of IT facilities for both schools and the ED. The SAMS and the EDIS were launched under the strategy. The SAMS, launched in 1994, provides schools with a networked computer system to assist in their administration and management processes and enables the electronic transmission of information between schools and the ED. A list of SAMS applications is at Enclosure 4. The project rolled out to some 1 000 schools and was completed in 1998. The EDIS, also launched in 1994, provides 1 300 officers with computers connected to the ED network and the Internet. A list of EDIS applications is at Enclosure 5. The project was completed in 1996.

Encl. 4

Encl. 5

25.   However, with the rapid development in IT, the SAMS and the EDIS could no longer meet the expectations and needs of users in schools and the ED. The general feedback from users is that the processing speed of the system is too slow. The ED commissioned a consultant in late 1998 to conduct a study to identify areas for improvement and to recommend enhancement solutions. The study was completed in end 1999. The final proposals in this submission are based on the consultant's recommendations with modifications taking into account the latest IT developments and users' requirements.

26.   We consulted the Education Panel of the Legislative Council on these proposals on 8 June 2000. The Panel supported the proposals.

Education and Manpower Bureau
June 2000

Cost and Benefit Analysis of the Enhancement Project
(at 1999-2000 price level)

	2000-01 $'000	2001-02 $'000	2002-03 $'000	2003-04 $'000	2004-05 $'000	2005-06 $'000	2006-07 $'000	2007-08 $'000	Total $'000
COSTS									
Non-recurrent									
SAMS	23,126	108,038	184,889	0	0	0	0	0	316,053
EDIS	861	31,070	28,002	0	0	0	0	0	59,933
Sub-total	23,987	139,108	212,891	0	0	0	0	0	375,986
Recurrent									
SAMS	20	2,680	9,951	16,385	16,385	16,385	16,385	16,385	94,576
EDIS	0	1,187	7,048	9,653	9,653	9,653	9,686	9,686	56,566
Sub-total	20	3,867	16,999	26,038	26,038	26,038	26,071	26,071	151,142
Less recurrent cost of maintaining existing systems	0	(745)	(6,958)	(7,840)	(7,840)	(7,840)	(7,840)	(7,840)	(46,903)
Total costs	**24,007**	**142,230**	**222,932**	**18,198**	**18,198**	**18,198**	**18,231**	**18,231**	**480,225**

/BENEFITS.....

	2000-01 $'000	2001-02 $'000	2002-03 $'000	2003-04 $'000	2004-05 $'000	2005-06 $'000	2006-07 $'000	2007-08 $'000	Total $'000
BENEFITS									
Non-realisable benefits [Note]									
SAMS	2,072	43,515	192,710	207,215	207,215	207,215	207,215	207,215	1,274,372
EDIS	0	0	13,084	15,700	15,700	15,700	15,700	15,700	91,584
Total benefits	**2,072**	**43,515**	**205,794**	**222,915**	**222,915**	**222,915**	**222,915**	**222,915**	**1,365,956**
Net benefits	**(21,935)**	**(98,715)**	**(17,138)**	**204,717**	**204,717**	**204,717**	**204,684**	**204,684**	**885,731**
Cumulative benefits	**(21,935)**	**(120,650)**	**(137,788)**	**66,929**	**271,646**	**476,363**	**681,047**	**885,731**	

(Note) :

Non-realisable benefits are calculated based on the assumption that a notional saving of 1% in staff cost could be achieved by improved efficiency and productivity gains.

Recurrent Cost of the Enhancement Project

	2000-01 $'000	2001-02 $'000	2002-03 $'000	2003-04 to 2005-06 $'000	2006-07 and onwards $'000
SAMS					
(a) Hardware [1]	0	615	2,713	7,877	7,877
(b) Software [2]	0	0	73	784	784
(c) Support services [3]	0	1,890	6,713	7,425	7,425
(d) Consumables [4]	20	175	452	299	299
Sub-total	20	2,680	9,951	16,385	16,385
EDIS					
(a) Hardware [5]	0	0	716	2,653	2,653
(b) Software [6]	0	666	4,481	4,953	4,986
(c) Support services [7]	0	521	1,851	2,047	2,047
Sub-total	0	1,187	7,048	9,653	9,686
Less cost of maintaining existing systems	0	(745)	(6,958)	(7,840)	(7,840)
Total	**20**	**3,122**	**10,041**	**18,198**	**18,231**

/Notes .....

Notes:

(1) The expenditure is for maintenance of computer equipment of the SAMS.

(2) The expenditure is for acquisition and renewal of software licences.

(3) The expenditure is for provision of support services such as security audit of the SAMS network and advice on the administration and management of the SAMS.

(4) The expenditure is for consumables such as printer toners.

(5) The expenditure is for maintenance of computer equipment of the EDIS.

(6) The expenditure is for acquisition and renewal of software licences.

(7) The expenditure is for provision of support services such as security audit of the EDIS and system support.

Implementation Timetable for the Enhancement Projects for the SAMS and EDIS

Activities	Expected commencement date	Expected completion date
The SAMS		
(i) For schools which will procure computers and conduct site preparation works on their own		
Disbursing cash grants (Action: Government)	October 2000	December 2000
Procuring SAMS computers and conducting site preparation works (including integration of the SAMS network and the IT in education network) (Action: schools)	January 2001	August 2001
(ii) For schools which would like the Government to conduct site preparation works but will procure computers on their own		
Disbursing cash grants (Action: Government)	October 2000	December 2000
Tendering out site preparation works (including preparation of tender documents) (Action: Government)	October 2000	May 2001
Procuring SAMS computers (Action: schools)	January 2001	August 2001
Conducting site preparation works (including integration of the SAMS network and the IT in education network) (Action: Government)	May 2001	December 2001

Activities	Expected commencement date	Expected completion date

(iii) For schools which would like the Government to conduct site preparation works and to procure computers

Activities	Expected commencement date	Expected completion date
Tendering out site preparation works and procurement of computers (including preparation of tender documents) (Action: Government)	October 2000	May 2001
Procuring SAMS computers and conducting site preparation works (including integration of the SAMS network and the IT in education network) (Action: Government)	May 2001	August 2002

Conversion of the SAMS into a web-based application

Activities	Expected commencement date	Expected completion date
Tendering out the conversion of the SAMS into a web-based application (including preparation of tender documents) (Action: Government)	October 2000	March 2001
Converting the SAMS into a web-based application (Action: Government)	April 2001	March 2002
Rollout of the web-based SAMS to schools (Action: Government)	January 2002	October 2002

The EDIS

Activities	Expected commencement date	Expected completion date
Installing enhanced hardware and software (Action: Government)	November 2001	June 2002

**Functions and Applications of the
School Administration and Management System (SAMS)**

There are altogether 16 applications in the SAMS –

- School management
- Student
- Staff
- Student assessment
- Student attendance
- Staff deployment
- Timetabling
- Allocation
- Hong Kong Examinations Authority (HKEA) for secondary schools
- Special Education for special schools
- Programme schedule
- Financial monitoring and planning
- Housekeeping
- Security
- Inter-year processing
- Data management

To facilitate electronic communication between the ED and schools, a Communication and Delivery System is also installed in the SAMS to serve as an interface between the SAMS and other computer systems of the ED and the HKEA.

In addition, the SAMS has an "end-user computing" function which allows schools to extract data from the system database for developing add-on computer applications meeting their specific needs.

**Functions and Applications of the
Education Department Information System (EDIS)**

The EDIS consists of the following application systems –

- School information management

- Student information management

- Teacher information management

- School places allocation
    1. Primary One Admission
    2. Secondary One Allocation
    3. Secondary Four Allocation
    4. Secondary Six Allocation

- Financial management and budgeting

- Security control

The major objective of the EDIS is to establish core databases on schools, students and teachers so to provide necessary information to the ED for allocation of school places, registration of schools, teachers and school managers as well as planning of various services.