

E-GOVERNANCE UNIT, PRIMARY & SECONDARY EDUCATION DEPARTMENT

PROCEEDINGS OF THE TAP MEETING HELD UNDER THE CHIRMANSHIP OF ADDITIONAL CHIEF SECRETARY TO GOVERNMENT, PRIMARY AND SECONDARY EDUCATION, AT 3.00 PM ON 20.09.2017.

Members present:

1. Sri. Ajay Seth, IAS, Additional Chief Secretary to Government, Primary and Secondary Education
2. Sri.S.Ramanathan, Group Director, Computers and Information Group, ISRO Satellite Centre, HAL Airport road Vimanapura Post Bengaluru-560017.
3. Prof.Chandrashekhar Ramanathan, IIIT, Bengaluru
4. Sri. Vinaya. B. SIO and DDG, NIC Bengaluru.
5. Sri, Thangavelu, Sr. Director, NIC, Bengaluru
6. Sri. G.N.Datanal, CEG, DPAR, Bengaluru
7. Sri. Ramesh, Deputy Secretary, Finance Department, Bengaluru
8. Sri. K. Narayan, Director, Department of Planning, Bengaluru.
9. C. Shikha, Director, Pre-University Education, Bengaluru.
10. Sri. P.C. Jaffer, State Project Director, SSA/RMSA Bengaluru
11. Sri. Gopalakrishna, Director, DSERT, Bengaluru
12. Smt. Aparna Pavate, Internal Finance Advisor and Deputy Secretary Government, Planning, Education Department.

The meeting of the Technical Advisory Panel was held on 20.09.2017 to consider the following proposals of the department of Primary and Secondary Education.

- i. To consider the proposal of Pre-University Education department to approve the specifications of the Laptops and Projectors for use in Pre University Colleges;
- ii. To decide on the Mini PCs/ All in one Desktops PCs, and UPS for use at schools under Technology Assisted Learning Programme (TALP);
- iii. Content Distribution Network(CDN) for use under IT@Schools;
- iv. Equipment for Up-gradation of SIT Studio, Krishna Studio and Audio room at DSERT;
- v. Tablets for school processes and data collection for SATS.

1. Laptops and Projectors for use in Pre-University Colleges:

Director, Pre-University Education presented that the department intends to implement Technology Assisted Learning Programme in the select 250 Government Pre-University

Colleges during 2017-18. As a part of the programme these colleges require to be equipped with Laptops and Projectors. The Director further requested that since these laptops and projectors would be used to improve the teaching practices in the classrooms by the lecturers, the specifications of the Laptops and Projectors approved by the Committee in its meeting dated 19.11.2016 for IT@schools could be adopted for this purpose also. The TAP- having examined the proposal agreed that the specifications as in Annexures 3 and 4 to the proceedings dated 19.11.2016 could be adopted by the Department of Pre-University Education with the following modifications.

- i. Processor can be of 7th generation.
- ii. RAM can be 8 GB and no expandability should be required.
- iii. Power back up of the battery can be insisted for 4 hours instead of number of the cells in the battery.
- iv. Operating System should be dual boot pre-loaded with Windows 10 and Ubuntu instead of Windows alone.

Both OS have been suggested for lecturers to facilitate flexibility for lecturers for content generation and curation, even though IT@Schools system for students are to be using open source software only.

2. Mini PCs/Desktops and UPS for use at schools under IT@Schools:

The PCs for IT@School are to be used by students to learn their subjects better through curated e-content provided by DSERT or developed by their teachers. All these contents are to be open source content only.

In the previous TAP meeting held on 9.6.2017, it was noted that Mini PCs were new products in the market; they were not rugged enough; the service and spare support for them was not well spread throughout the state; and the All-in-One desktops on the other hand had more wide usage and were more rugged. Further the members had suggested that they might be tested on the parameters like ruggedness, power consumption and the requirements of the department. While comparing the products care should be taken to see that the processors are near similar. Centre for e-governance was requested to help the Director DSERT in conducting the tests.

In this meeting, Director, DSERT submitted that the suggested comparative study could not be organized. The views expressed in the previous meeting were once again noted. In particular, it was noted that the only advantage of Mini-PCs is lower power consumption, but there are several uncertainties regarding their performance, ruggedness and after-sales services. Considering that these computers are needed for schools where ruggedness, reliability and after-sales service are more important, the TAP members recommended the following.

- i. Current entry level All-in-One PCs should be procured for use by the students.



- ii. One PC in each school can be of higher capacity in terms of RAM, memory and optical reader/writer. This PC is to be connected to SDC.
- iii. There is no need to seek expandable RAM.
- iv. The display size can be moderate.
- v. These PCs should have open source operating system and latest version of OpenOffice suit only as IT@School project envisages open source software and e-content only.

The technical specifications of these PCs are detailed in Annexure 1 and 1A.

Regarding the proposal of procuring new UPS and batteries, it was noted that the UPS and batteries purchased almost 5 years back for ICT3 project were not put to use at all. At this stage, it may not be possible to use those batteries as they might have got discharged. However, UPS should be in good condition. The statement based on examination of UPS and batteries organized by DSERT merely record whether they are functioning or not. It should be possible to repair UPS in case they are not functioning. DSERT was advised to organize re-examination of UPS and batteries in each school once again with clear TOR on following lines.

- i. Whether the batteries are in usable condition?
- ii. Whether UPS is functioning? If not, reason for the same? Can that be repaired?

It was noted that the PCs are to be used by students to learn their subjects better through the curated e-content as complementary to class-room learning. Continuous power supply is not essential or critical for the project objective. Therefore, UPS and batteries for new schools under IT@School need not be a priority item for procurement. The focus at this stage should be on teachers' training, curation of e-content, and PCs.

In view of the above discussion, the proposal for fresh procurement of UPS and batteries was not recommended.

3. Content Distribution Network(CDN) for use under IT@Schools;

This proposal is based on a successful experimentation done Ek-Step organization to find a low-cost solution for schools with intermittent or low bandwidth connectivity, or no connectivity at all. The organization has developed the prototype hardware as well the required software to monitor the usage of the e-content provided through the device.

In schools with intermittent or low bandwidth connectivity, the CDN device can be connected to the State Data Center and the device can download and download the e-content as and when the connectivity gets available. Thereafter, the e-content can be distributed to the PCs or other devices (laptops, tablets, or mobile phones) available in the school through the local wi-fi network of the CDN device. There will not be any need to set up a wired LAN in such schools. The software in the CDN device is designed to monitor usage of the e-content

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downloaded from device by the PCs and other devices in the school. The usage data can be provided to SDC for monitoring at the state level.

In schools without internet connectivity, the e-content can be pre-loaded in the CDN device and thereafter can be augmented by sending new content on pen-drive or laptop through CRPs.

A presentation on following lines was made to the Panel by the Ek Step professionals.

The CDN can be used to serve to end-users with high availability and high performance/speed, content including web objects (text, graphics and scripts), downloadable objects (media files, software, documents), applications (e-commerce, portals), live streaming media, on-demand streaming media, and social networks.

Localized CDN is a platform to deliver content to a Localised Community or group of users. Content residing on these platforms are mostly curated to be consumed by the community users on a frequent basis. Localized CDNs can be either deployed on-premise or in the cloud based on the connectivity and requirements.

Offline Localized CDN is the localised CDN without the need of Internet. The benefits of these are-

- Disconnected geography and no connectivity
- Slow Internet Speed, not enough to Stream/Download high quality Video Content.
- Same set of Content to be consumed, need not be downloaded through Internet every time. caching is a good solution.

Offline Localized CDNs can be used to access the Course Curriculum, Teacher Reference Material, Digital Library and as Admin tool in schools and colleges.

CDN (Content Delivery Network) in Schools:

Open Localized CDN devices can be preloaded with Digital content (ebooks, Videos, Audio, Pictures...). Content can be refreshed either through Laptop or USB using the Admin Portal of the device.

- i. CDN will publish a Hotspot with the configured SSID when powered on.
- ii. End Devices (Laptop/Desktop/Tablets/Smartphones) connect to the Open CDN using the published WiFi.
- iii. Post Connection, Laptop/Desktop to open the configured URL to access the Content residing at a local storage unit and Smartphones/Tablets can access the content through Open CDN compliant App. Apps could further develop plug-ins to OpenRAP stack to automate data and content synchronization.



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- iv. All the Analytics data can be gathered like “who is watching what, most popular videos watched, who all logged-in...” can also be seen on the Dashboard either Offline and Online.
- v. The software developed by Ek Step is open source and can be customized for requirement of IT@School.

The Panel on detailed discussion recommended to try out the Content Distribution Network in about 100 select schools not having wired LAN, evaluating the performance before considering the scaling-up. The specifications of the hardware and software for the Content Distribution Network as in Annexures 2 & 3 were approved.

4. Up-gradation of SIT Studio, Krishna Studio and Audio Room at DSERT

The TAP was briefed that the two studios set up at DSERT are being used by DSERT, VTU, Collegiate and Technical Education for transmission of lessons to students spread over various geographical locations, where equipment and receiving terminals have been provided. The content and format that is currently being used needs to be revisited to improve the quality of the content delivery. The two studios and audio room at DSERT are currently being used on paid basis. With a view to achieve economy and self-sustenance in curating and content creation, the two studios and audio room need to be augmented. ISRO, Bengaluru and DECU Ahmadabad have been providing technical support to DSERT for managing the facility. They have suggested the list of equipment for these studios. The cost of the upgradation is estimated to be around Rs.1.2 crores.

Having considered the need to upgrade the audio studio and the two studios at DSERT, the committee approved the equipment as listed in Annexure 4, 5 & 6.

5. Tablets

The department proposes to procure about 10000 tablets for following purposes.

- i. About 6000 tablets are needed for schools with large number of students, say 200 and above, to manage school level processes on SATS and for a pilot for teachers' biometric attendance. Once the system gets stabilized in 6000 large schools, expansion of direct use of SATS in smaller schools and biometric attendance of teachers in those schools is planned to be rolled out. More tablets will be needed at that stage.
- ii. About 4000 tablets are needed for use by Cluster Resource Persons (CRPs) to capture school level data in SATS once in a fortnight when they visit the school. These tablets with CRPs are also be used for Aadhaar validation of students once in a year and for demographic updating of Aadhaar or SATS data, in case of discrepancies.

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The Panel members noted that Aadhaar biometric applications can work well on tablets with android operating system. However, Aadhaar demographic updating applications require Windows operating system. It was also noted that there are not many choices of tablet with Windows OS. It was also noted that the tablet with CRP should have large battery life as data entry in each school is planned to be done at the school level by the CRP and power supply at the time of his visit may not be available.

In view of above considerations, the Panel recommended that low-weight (as it has to be carried by CRP) entry-level laptops with Windows OS and 4-hour battery may be procured for CRPs instead of tablets.

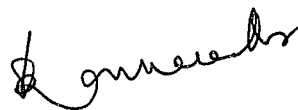
The panel discussed the tablet specifications proposed by DSERT, and suggested that specifications for about 6000 tablets and about 4000 laptops (one per CRP) can be finalized after obtaining inputs from E-Governance Department. The same can be included in proceedings of the meeting

The specifications after consulting the representative of E-Governance Department are attached as Annexure 7 and 8.

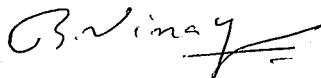
The meeting concluded with a vote of thanks.



Ajay Seth
Additional Chief Secretary
Primary and Secondary Education



S. Ramanathan
Group Director
Computers and Information Group,
ISRO Satellite Centre



Vinaya B.
Deputy Director General
& State Informatics Officer, NIC



Chandrashekhar Ramanathan
Professor
IIITB

Annexure 1

AIO PC for IT@School to be used as Server

SI No	Description	ALL-in-One Technical Specification
1	Processor	Intel Core i3-7100 (3.9GHz, 3MB cache) or AMD A10 9700 (3.5 GHz, 2MB cache) or higher
2	Chipset	Intel B series/ AMD B series chipset
3	Motherboard	OEM Motherboard with Hardware TPM 2.0
4	RAM	8 GB DDR4 2400 Mhz RAM or higher
5	Hard Drive	1 TB SATA HDD or higher
6	Optical Drive	DVD Reader and Writer
7	Audio	Integrated HD Audio with two internal speakers (2W x 2)
8	Ethernet	Integrated Gigabit Ethernet Connection (10/100/1000Mbps)
9	Wi-Fi	802.11 b/g/ac
10	Display Monitor	19.5" HD, Anti-glare Display or higher
11	Keyboard	USB Keyboard (Same make as PC)
12	Mouse	USB 2 button Optical Scroll mouse (Same make as PC)
13	Ports	5 USB ports or higher (minimum 2 USB 3.0), 1 Ethernet (RJ-45), 1 HDMI port , headphone / microphone combo jack (3.5mm)
14	Webcam & Mic	Integrated HD Webcam with Microphone
15	Certifications	For OEM : ISO 9001 : 2008 or Latest
		For PC : MS Windows, Energy Star, EPEAT
16	Operating System	Preloaded Linux, Ubuntu <i>Ubuntu</i>
17	Antivirus	Pre-Loaded with Latest version of Antivirus Symantec / MacAfee / NOD32 / eTrust / Kaspersky / eScan / Quickheal with 3 Years License
18	Software	Pre load with Open Office
19	Accessories	With required connecting cables and driver media should be supplied
20	Warranty	3 Years Onsite comprehensive warranty.

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Annexure 1A

AIO PC for IT@School

SI No	Description	ALL-in-One Technical Specification
1	Processor	Intel Core i3-7100 (3.9GHz, 3MB cache) or AMD A10 9700 (3.5 GHz, 2MB cache) or higher
2	Chipset	Intel B series/ AMD B series chipset
3	Motherboard	OEM Motherboard with Hardware TPM 2.0
4	RAM	4 GB DDR4 2400 Mhz RAM or higher
5	Hard Drive	500 GB SATA HDD or higher
6	Audio	Integrated HD Audio with two internal speakers (2W x 2)
7	Ethernet	Integrated Gigabit Ethernet Connection (10/100/1000Mbps)
8	Wi-Fi	802.11 b/g/ac
9	Display Monitor	19.5" HD, Anti-glare Display or higher
10	Keyboard	USB Keyboard (Same make as PC)
11	Mouse	USB 2 button Optical Scroll mouse (Same make as PC)
12	Ports	5 USB ports or higher (minimum 2 USB 3.0), 1 Ethernet (RJ-45), 1 HDMI port , headphone / microphone combo jack (3.5mm)
13	Webcam & Mic	Integrated HD Webcam with Microphone
14	Certifications	For OEM : ISO 9001 : 2008 or Latest For PC : MS Windows, Energy Star, EPEAT
15	Operating System	Preloaded Linux, Ubuntu Ubuntu
16	Antivirus	Pre-Loaded with Latest version of Antivirus Symantec / MacAfee / NOD32 / eTrust / Kaspersky / eScan / Quickheal with 3 Years License
17	Software	Pre load with Open Office
18	Accessories	With required connecting cables and driver media should be supplied
19	Warranty	3 Years Onsite comprehensive warranty.

Any contest between Intel and AMD to be decided at the time of pre-bid meeting and should not be taken up at the time of technical evaluation.

Annexure 2

Hardware Specification for Content Delivery Network (CDN)

Parameter	Specification	Notes
Processor and cache	ARMV7 Quad Core @ 1.2 Ghz or Equivalent	With minimum 2400 MIPS integer performance
Memory	1 GB LPDDR2-900 SDRAM	
Storage	Minimum of 32GB, solid state storage	Must be extendable
Networks supported	Wireless LAN 802.11a/b/g/n	
	Ethernet LAN, 100 mbps or more	
Power consumption	Under maximum load, must consume less than 12.5W	Average operating wattages must be less than 5 W
Additional ports to be supported	Two ports of USB 2.0 ports or more.	
Additional Ports – Recommended	HDMI 2.0	For connecting to the monitor
Performance Criteria	Concurrent video streaming of up to 20 active connections.	
Enclosure	IP 50 Enclosure or more	Dust Resistant enclosure, assuming CDN would be placed in an in-house.

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Annexure 3

Software Specifications of Content Delivery Network (CDN)

Parameter	Specification	Notes
Bootup time	The device must boot and operate in normal mode within 15 seconds	
Basic Services	Must support, DHCP and DNS server, HostAP software, Python, Python-django framework, Nginx and udev services as a part of OS	All services version as per Debian 8, with exception of django version 1.11.5
Localized offline CDN Software	Open RAP version 1.0 readiness. RAP platform resolves the offline resource access needs...	

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Annexure 4


List of Equipment for SIT and Krishna Studio

Sl. No.	Equipment	Qty.
1	HD Camcorder	2
2	Heavy Duty with Dolly for TP Camera	1
3	Tripod with Dolly	1
4	17" Teleprompter with Computer	1
5	UHF Cordless Lavalier microphone with Bodypack transmitter and receiver.	3
6	Handheld with table top & UHF plug-on transmitter	3
7	Two way Active Audio Monitors	4
8	LED Studio Lights	12
9	LED Light Stand	4
10	Desktop Document/visualizer Camera	1
11	Laptop computer with HDMI output for Presentation.	1
12	HDMI to HD/SD SDI converter	1
13	40" LED/LCD TV Monitor with ceiling mount	
14	32" LED/LCD TV Monitor with stand	
15	SD/HD Vision Mixer with accessories	
16	Audio Mixer	
17	Talkback Intercom system	
18	Character Generator System	
19	Memory recorder (SD/HD-SDI) with Adapter	
20	Memory Card (64 Gb minimum)	
21	19" Rack-Mountable Frame with at least 10 card (module) slots for converter and other cards mentioned from 16.1 to 16.4	
22	Standalone converters	1 Set
23	Blu-Ray / DVD Player	1
24	Graphic Tablet	1
25	Tablet interactive PC podium mounted with Pen	1
26	10 KVA On-Line UPS system with 30 mins. Backup	1 Set
27	NLE System	1 Set
28	NAS Storage	1 Set
29	19" Rack with required balanced audio cables, HD SDI video cables, interface cables are of suitable lengths, connectors, necessary converters and power distribution cables etc. for Installation & Commissioning on turnkey basis.	1

Annexure 5

Sl. No	Equipment	Qty.
1.	Digital Audio Workstation (Editing Machine) System	
2	Multi track Audio processing software subsystem	1
3	Audio I/O Interface hardware subsystem	1
4	Host Workstation (certified by software and hardware sub system manufacturer	1
5	Condenser Mic with stand and windscreen	1
6	Two way Active Audio Monitor (pair)	1 Set
7	Dynamic Mic With Stand	2
8	CD/DVD Player with HDMI/DVI-D and Analog Audio out	1
9	Tape less Audio Recorder	1
10	Head phone Amplifier	1
11	19" rack mountable frame with Modular ADA Card	1
12	Analog Audio Distribution Amp module (card)	1
13	Required audio cables and interface cables of suitable lengths, connectors, necessary converters and power distribution cables etc. for Installation & Commissioning.	1 Set






Annexure 6

Additional Requirements for Krishna Studio, SIT Studio and Audio Room

SI No	Equipment	Qty.
SIT Studio		
1	HD Camcorder	1
2	Memory Card- 64 GB (minimum)	3
3	Tripod for HD Camcorder	1
KRISHNA		
1.	Microphone - Clip-on (Lapel/lavaliere) with UHF Wireless body pack transmitter and rack mount receiver Set	1
2.	Interactive Tablet (Minimum 21") with Pen	1
3.	LED Studio Lights	4
Audio Studio		
1.	Digital Audio Mixer	1
2.	Condenser Mic with stand and windscreen	1

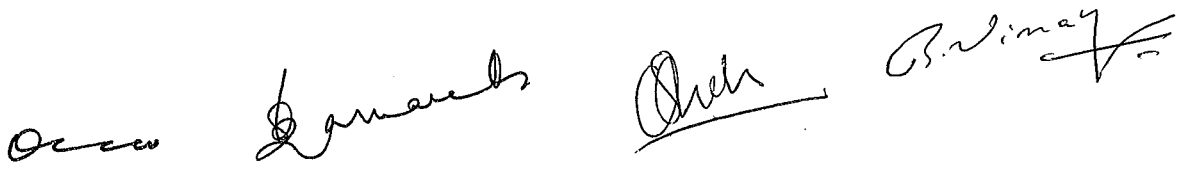
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Annexure 7

Specifications of Tablets (Android OS) for Schools

SI No	Description	Specification
1	Processor	Minimum 1.3 GHz Quad core or Higher
2	SIM	GSM SIM Card slot
3	Network Support	2G, 3G & 4G Support
4	Display	Minimum 8" inches Capacitive touch screen or higher Minimum resolution 1280 x 800 pixels
5	Internal Storage	16 GB or Higher;
6	RAM	2 GB or above
7	Connectivity	- Mandatory EDGE / 3G & 4G Mobile data support - 802.11 a/b/g/n/ac
8	Camera	Primary (Rear) – 5 MP or higher with Auto Focus Feature Secondary camera – 2 MP or higher
9	Operating System	Android 6.0 or higher
10	Audio	Internal Speaker; 3.5 mm Audio Jack
11	Location Technology	GPS & AGPS facility for capturing the location coordinates
12	Certification	BIS certification, CE/FCC
13	Battery	Minimum 4000mAh Battery or Higher
14	Bluetooth	Bluetooth v4.0 or higher
15	Warranty	3 Years warranty at district level

Additional Requirement: There should be a capability to attach UIDAI approved external biometric authentication device. Biometric reader in the tablet itself is not needed.



Annexure 8

Laptop for CRPs

Specification for Laptops	
Constructions and Externals	Metal / Alloy / reinforced hinges for display. The Casing ABS plastic of Black or Grey Color Display screen back with Government approved designed Logo.
Processor	Intel® Core™ i3-6006U/ AMD A8-7410 series processor or Equivalent <ul style="list-style-type: none"> • 2.0 GHz or higher frequency • 2MB Cache • 64-bit support • Launched in the year 2015 or later
Operating System	Genuine Microsoft Windows-10 Pro 64Bit
Chipset	Chipset compatible to above mentioned processor.
Main Memory	4 GB DDR3 1600Mhz RAM or higher
LCD Display	14.0 inch or higher LED Backlight LCD Display with 1024X768 resolution
Graphics	On board HD Graphics
Hard Disk Drive	1TB SATA HDD or higher
Camera	Web Camera
Connectivity	Onboard RJ45 10/100/1000 Mbps Ethernet controller
	WLAN: IEEE 802.11b/g/n WLAN Module
	Built in Blue tooth v4.0 or higher
Interface, I/O Port	Combo jack port or One Mic in, OneSpeaker/ Headphone-outjack
	One HDMI Port, One VGApport/ USB to VGA Converter
	Min TwoUSB2.0 ports, one USB 3.0 port
Audio	High Definition Audio standard support
	Build-in stereo speakers
	Build-in Microphone
Battery backup	Minimum 4.0 Hours
Power Management	Full feature ACPI power management standard: supports Stand-by and Hibernation power saving modes
AC adapter	Standard 3 pin power adaptors for India with Power Cord
Pointing Device	Built-in touch pad with scroll
Keyboard	Standard Qwerty Keyboard
Warranty	3-years comprehensive warranty (including for battery pack) at district level.
Certification	EnergyStar 5.0, Windows 10, ISO 9001:2008 certificate for OEM, EPAT Registered
Bag	Backpack carry bag.

