To
The Hon'ble Minister of Education,
Government of Rajasthan

Sub – Specification of specific proprietary software in the tender document for purchase of laptops.

Dear Sir,

We, the undersigned, appreciate the efforts seeking to establish ICT infrastructure in Rajasthan school system to promote learning. In this context, we feel it is critical to promote the use of Free and Open Source Software (FOSS) applications in place of proprietary applications for various reasons discussed in our letter. Unfortunately the tender floated by the Government of Rajasthan for the purchase of 112,000 laptops specifies the Operating System as MS Windows 7 Home Basic or Windows 8, and includes Microsoft Office Professional Suite, Adobe Acrobat Writer Professional.

1. **Waste of scarce public funds**

These proprietary software applications are quite expensive, for example, Adobe Acrobat Writer[1] costs around Rs 12,000, basic Windows operating system Rs 4,000 and Microsoft Office around Rs. 10,000. Even if the vendor provides these at highly discounted 'academic' prices; it would not cost less than 50 crores of rupees for the 112,000 laptops. While FOSS equivalent to these applications is easily available, free to share and free of cost. Periodic upgrades of FOSS applications are also free, whereas each upgrade of proprietary software would need to be paid for. This procuring proprietary software is a unecessary waste of scarce public funds.

Digital learning resources (content) and digital learning tools/ processes (software applications), which together constitute curricular resources, need to be in line with established curricular principles. An important principle of public education systems is that **curricular resources need to be publicly owned**, so that they are freely available to teacher educators, teachers and students without restrictions. In the case of traditional print media (books), the public education system does not use proprietary curricular resources, since that prevents the schools, teachers and students from freely sharing the resources and from customising them for their local needs. **In the same manner, proprietary (meaning privately owned, which is prohibited by the owner, from being shared or modified) software and proprietary content should not be used in education.**

2. **Government policy support for the adoption of FOSS.**

Proprietary software and content forces the teacher and the student to be a 'mere user'; treating these resources as a 'given'. Teachers, schools and the entire public education system become dependant on the vendor for modifications, enhancements, customisations or localizations (creating local language versions) to these tools, and have no right to modify or freely share these resources with one another. Proprietary resources thus do not allow the needed experimentation, collaborative construction, and local/ contextual enhancement of learning processes, important new opportunities offered by digital technologies, required to meet the constructivist ideals aspired for by numerous policy documents including the **National Curriculum Framework 2005**. Thus privatised digital learning processes (in form of proprietary software or content) are detrimental to educational aims.

The **National Policy on ICTs in education**, which was accepted by CABE in June 2012, clearly emphasises the need to adopt FOSS applications in school education, as well as free and open learning resources to create a collaborative and creative ecosystem. The use of proprietary software, by forbidding sharing and co- creating, clearly harms the possibilities of such a free and open ecosystem.
The national policy says "A software environment favouring a pedagogy of learning which

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1   http://shop.adobe.com/store/adbehap/en_IN/pd/ProductID.254757300/Currency.INR

promotes active learning, participatory and collaborative practices and sharing of knowledge is essential to nurture a creative society. Free and Open Source Software – operating system and software applications will be preferred in order to expand the range of learning, creation and sharing."

The **MHRD 12th plan guidelines for Teacher Education, June 2012** clearly emphasizes the need to use publicly owned software (FOSS) and content, and discuss the grave dangers of using proprietary software.

Recognising the dangers from proprietary/ closed standards, the DIT, Government of India has notified, in November 2010, the policy on **Open standards in eGovernance** in which it has mandated that office documents should be shared only in the ODF format (.odt/.ods/.odp which are the native formats used by openoffice/libreoffice, both free office suite software applications) and not in proprietary formats (.doc/.xls/.ppt) used by popular proprietary Microsoft office suite.

3. Rich learning environment using public educational software tools

There are public software applications (which by virtue of public ownership are freely shareable and customisable) for all areas where proprietary software applications have been used. At a systemic level, public software has very successful been used in "ICT@schools" program of Kerala, which is now being emulated in Karnataka, Gujarat and other states in India. **There cannot be any justification to teach proprietary software in public schools when publicly owned alternatives are available and used by millions of people all over the world.**

In addition, the use of publicly owned software has other important advantages:

1. Since publicly owned software applications are free to procure and share, the costs of using freely shareable software applications would be much lower specially for implementing at a large scale, where the necessary support systems are feasible to build. An IIM-Bangalore study estimate that on a conservative basis, Kerala IT@Schools program has saved 50 crores on software license fees and India would save 20,000 crores each year by adopting a similar approach.
2. The free GNU/Linux operating system is **virus-resistant** and this can hugely reduce maintenance and support efforts and resources. A large number of computers in educational institutions tend to remain unused due to virus issues and using GNU/Linux would increase infrastructure availability.
3. A large number of educational software applications can be bundled free with the GNU/Linux operating system which means they can be available to teachers and schools in a simple single installation process. The ICT in school programs of Kerala and Gujarat use the Ubuntu GNU/Linux operating system, bundled with the educational tools. Upgrades can also be done easily and freely every year, whereas proprietary software is usually not upgraded owing to its financial implications.

C-DAC is the premier R&D organization of the Department of Electronics and Information Technology (DeitY), Ministry of Communications & Information Technology (MCIT) for carrying out R&D in IT, Electronics and associated areas has developed BOSS[2] (Bharat Operating System Solutions). It has also offered support to state governments for implementation of ICT within school programmes. Under these circumstance, we find it difficult to understand why proprietary software is still being specified in this tender and request that should be replaced with FOSS applications.

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2   The Beta Release of BOSS GNU/Linux Version 4.0 is coupled with GNOME Desktop Environment with wide Indian language support & packages, relevant for use in the Government domain.

Laptop distribution as a part of a larger effort for integrating ICTs in education
We are of the view that the scheme of distribution of laptops free of cost to meritorious students studying in various secondary and senior secondary Government Schools/Government aided schools needs to be seen as a part of a larger holistic effort to integrate ICTs into education. Teacher preparation is critical to ensure that the infrastructure is made accessble and meaningfully used. It is likely that students would not be aware of the risks that come along with access to computer/Internet, nor would they be aware of the possibilities of using these for actually supporting their learning. Not keeping this in mind might lead to this scheme becoming a wasteful expenditure of public funds as well as harmful to young minds.

We look forward to your response and to further discussing this important issue.

Yours truly,

Signatories (PTO)

February 22, 2013

Copy :
1. Chief Minister, Government of Rajasthan
2. Education Secretary, Government of Rajasthan
3. Director, Primary Education, Bikaner, Primary Education
4. Director, SIERT, Udaipur
5. Chairman, Board of Secondary Education, Ajmer
6. Secretary, Board of Secondary Education, Ajmer
7. Director, S.S.A., Rajasthan

Enclosed:
1. National Policy on ICTs in education, March 2012 (excerpt)
2. MHRD 12th plan guidelines, June 2012 (excerpt)
3. Policy on open standards in e-governance, DIT, GoI

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List of Signatories

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41. Vijay Baskar, MIDS, Chennai
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सेवा में,

श्रीमान शिक्षा मंत्री महोदय,

राज्य सरकार, राजस्थान

विषय – लैपटॉप की खरीद के लिए निविदा पत्र में दिए हुए कुछ चुनिंदा सॉफ्टवेयर की जानकारी।

श्रीमान,

हम राजस्थान की शिक्षा व्यवस्था में बच्चों के सीखने को बेहतर बनाने के लिए आई.सी.टी संरचना को स्थापित करने की प्रशन्सा करते हैं। इसी मामले में, हमें महसूस होता है कि निःशुल्क और मुक्त स्रोत सॉफ्टवेयर (FOSS – Free and Open Source Software) को उपरोक्त सॉफ्टवेयर की जगह उपयोग करना कई कारणों से अत्यंत महत्वपूर्ण है, जिन पर इस पत्र में चर्चा की गयी है। दुर्भाग्य से जो टेंडर राजस्थान सरकार के द्वारा ११२,००० लैपटॉप की खरीदी के लिए प्रसारित की गयी है, उस में Operating System के तौर पर MS Windows 7 Home Basic या Windows 8 का उल्लेख है, इसके अलावा Microsoft Office Professional Suite एवं Adobe Acrobat Writer Professional को भी शामिल किया गया है।

1. ## सार्वजानिक निधि का दुरूपयोग:

निविदा में जिन सॉफ्टवेयर का उल्लेख है, वे बहुत महंगे हैं। उदाहरण के लिये, Adobe Acrobat Writer की कीमत १२०००/– है, Windows operating system की कीमत ४,०००/– तथा Microsoft Office की कीमत लगभग १०,०००/– है। यदि व्यापारी इन सॉफ्टवेयर को शिक्षा में उपयोग की खातिर छूट में भी देता है, तब भी ११२००० लैपटॉप के लिए इनकी कीमत ५० करोड़ से कम नहीं होगी। वहीँ FOSS, जो इन सॉफ्टवेयर के समान ही है, आसानी से और मुफ्त में उपलब्ध है। FOSS में कालांतर में होने वाले बदलाव भी मुफ्त हैं, जबकि निविदा में उल्लेखित सॉफ्टवेयर के लिये और राशि खर्च करनी होगी। इन सॉफ्टवेयर को खरीदना सार्वजनिक निधि का दुरूपयोग हैं।

डिजिटल लर्निंग संसाधन और डिजिटल उपकरण प्रक्रिया (software applications), जो मिलकर पाठ्यचर्या के संसाधन रचते हैं, पाठ्यचर्या के स्थापित मानकों के आधार पर होने चाहिएं। सार्वजनिक शिक्षा प्रणाली का एक आधार यह है कि पाठ्यचर्या के संसाधन पर सबका अधिकार हो, ताकि वे शिक्षकों व विद्यार्थियों को आसानी से बिना किसी रूकावट के मिल सकें। वहीँ किताबों के बारे में, सार्वजनिक शिक्षा प्रणाली मालिकाना पाठ्यचर्या के संसाधनों का उपयोग नहीं करती है क्योंकि वह शालाओं, शिक्षकों और विद्यार्थियों को उसे बांटने या खुद की जरुरत के हिसाब से परिवर्तित करने से रोकती है। इसी प्रकार,

मालिकाना (जिस पर किसी व्यक्ति या कम्पनी मात्र का बांटने या बदलने का हक़ हो) सॉफ्टवेयर और सामग्री का उपयोग शिक्षा में नहीं होना चाहिये।

2. **FOSS के स्वीकरण के लिये सरकारी नीतियों का सहयोग:**

मालिकाना पत्यक्रम और सामग्री शिक्षक और विद्यार्थी को, संसाधनों को "दिया हुआ" दिखाकर, यदा–कदा के उपयोग के लिए मजबूर करते हैं। शिक्षक,विद्यालय और समस्त सार्वजनिक शिक्षा प्रणाली समय–समय पर सॉफ्टवेयर में की जा सकने वाली महत्वपूर्ण बदलावों के लिये व्यापारियों पर निर्भर हो जाता है और उनके पास न ही बदलाव करने का अधिकार होता है और ना ही इन संसाधनों को बाँटने की आज़ादी होती है। इस तरह, मालिकाना संसाधनों ना ही आवश्यक प्रयोगों को होने की अनुमति देते हैं, ना ही साझेदार संरचना की,और ना ही सीखने की प्रक्रिया से सम्बन्धित स्थानीय एवं प्रासंगिक परिवर्तनों की। अंकीय तकनीक के द्वारा प्रदान किये गये नए मौकों का उन कई अभिलाषित नीतियों (National Curriculum Framework 2005 के लिए भी) के लिये रचनावादी मानकों से मिलना जरूरी है। निजीकृत digital learning processes (मालिकाना सॉफ्टवेयर और सामग्री की रूप में) शिक्षा के क्षेत्र में हमारे लक्ष्यों के लिये हानिकारक हैं।

ICT शिक्षा की सरकारी नीति,जो CABE के द्वारा जून 2012 में स्वीकार की गयी थी, साफ़ तौर पर शालायी शिक्षा के लिये FOSS के उपयोग पर जोर देती है,साथ ही साथ स्वतंत्र और खुली हुई शिक्षण संसाधनों पर जो साझेदार और सृजनात्मक परितंत्र की रचना करें। मालिकाना सॉफ्टवेयर का उपयोग, बांटने को प्रतिबंधित करते हुए साफ़ तौर पर साझेदार और सृजनात्मक परितंत्र की रचना की संभावनाओं को नुकसान पहुंचता है। राष्ट्रीय नीति के अनुसार,"सीखने से सम्बंधित शिक्षा का एक ऐसा वातावरण जो त्वरित ज्ञान,भागीदार और साझेदार प्रयोगों और ज्ञान के आदान–प्रदान का प्रचार करता हो,एक सृजनात्मक समाज के पालन के लिए आवश्यक है। Free and Open Source Software – operating system और software applications को ज्ञान, सृजन और आदान–प्रदान की सीमाओं को बढ़ने के लिए प्राथमिकता दी जाएगी।"

MHRD 12th plan guidelines for Teacher Education,June 2012 साफ़ तौर पर FOSS के उपयोग की पैरवी करता है और मालिकाना सॉफ्टवेयर के उपयोग के खतरों पर चर्चा करता है। मालिकाना सॉफ्टवेयर के खतरों को मानते हुए,DIT, भारत सरकार ने नवम्बर 2010 में उल्लेख किया है,**Open standards in eGovernance** की नीति, जिसमे यह आदेश है कि कोई भी कार्यालयी पत्र ODF format (.odt/.ods/.odp which are the native formats used by openoffice/libreoffice, both free office suite software applications) में ही वितरित किया जाना चाहिए और ना कि प्रख्यात (.doc/.xls/.ppt) जो कि Microsoft office

suite की सामग्री हैं।

3. **सार्वजनिक शिक्षणीय सॉफ्टवेयर के उपयोग से सर्वश्रेष्ठ ज्ञान**

अर्जन का वातावरण: हमारे पास सभी क्षेत्रों के ऐसे सार्वजनिक सॉफ्टवेयर हैं जहाँ पहले मालिकाना सॉफ्टवेयर का उपयोग किया जा चुका है। प्रणालीय स्तर पर, सार्वजनिक सॉफ्टवेयर बहुत ही सफलता से "ICT@schools" केरल के कार्यक्रम में उपयोग किये गए हैं, जो की अब कर्नाटक, गुजरात और भारत के अन्य राज्यों में प्रावधान में लाये जा रहे हैं। **मालिकाना सॉफ्टवेयर से सार्वजनिक शालाओं में शिक्षा के प्रसार का कोई औचित्य नहीं है जबकि सर्व–अधिकृत विकल्प उपलब्ध हैं और लाखों लोगों के द्वारा दुनिया भर में उपयोग किये जा रहे हैं।**

जारी रखते हुए,सर्व–अधिकृत सॉफ्टवेयर की कुछ अन्य विशेषतायें निम्नलिखित हैं:

1. जबकि सर्व–अधिकृत सॉफ्टवेयर को उपलब्ध करना और उसका आदान प्रदान मुफ्त है,इन्हें उपयोग करने की कीमत बहुत कम होगी,खासकर बड़े पैमाने में इनका क्रियान्वयन,जहाँ सभी जरूरी सहायता संभव है। IIM–Bangalore के एक अध्ययन के अनुसार, Kerala IT@Schools program ने software license fees पर 50 करोड़ रुपये बचाये हैं और भारत लगभग २०,००० करोड़ रुपये बचाता इस तकनीक को उपयोग में लाने से।

2. मुफ्त GNU/Linux,**virus–resistant** है और इससे रख-रखाव एवं सहयोग व संसाधनों की बहुत बचत की जा सकती है। शिक्षण संस्थानों में बड़े पैमाने पर कंप्यूटर **virus** के कारण बंद पड़े होते हैं। GNU/Linux के उपयोग से आधारिक संरचना की उपलब्धि बढ़ेगी।

3. बड़े पैमाने पर शिक्षण सॉफ्टवेयर GNU/Linux के साथ मुफ्त में लिए जा सकते हैं, अर्थात उन्हें शिक्षकों और शालाओं को एक ही बार के साधारण installation की प्रक्रिया से उपलब्ध कराया जा सकता है। केरल और गुजरात के ICT शालाओं ने Ubuntu GNU/Linux के साथ अन्य शिक्षण उपकरणों को भी लिया। Upgrade करने की प्रणाली भी आसान और मुफ्त है,जबकि मालिकाना सॉफ्टवेयर में वित्तीय प्रतिबन्ध के कारण सामान्यतया ऐसी सुविधा नहीं होती।

ऐसी स्थिति में,हमें ये समझने में मुश्किल हो रही है कि निविदा में अब भी क्यों मालिकाना सॉफ्टवेयर का उल्लेख है। ये हमारा निवेदन है कि मालिकाना सॉफ्टवेयर के स्थान पर FOSS का उपयोग किया जाये।

शिक्षा में ICT के एकीकरण की बड़ी कोशिश के बतौर लैपटॉप वितरण:

हम यह विचार रखते हैं कि, सरकार द्वारा चलाये हुए हाई स्कूल और सीनियर सेकंडरी के मेधावी छात्रों को लैपटॉप का मुफ्त वितरण ICT की शिक्षा के एकीकरण के एक–एक बड़ी मुहिम के एक हिस्से के तौर पे देखा जाना चाहिए। शिक्षकों की तैयारी इस मामले में बहुत आवश्यक है कि उपकरण

सभी की पहुँच में हो और उनका सार्थक उपयोग हो। यह संभव है कि छात्र कंप्यूटर और इन्टरनेट के साथ आने वाले खतरों से वाकिफ न हों, और उन्हें उन संभावनाओं की भी जानकारी नहीं होगी कि कैसे इन्हें अपने ज्ञानअर्जन के लिए इस्तेमाल किया जाये। इन तथ्यों की दिमाग में ना रखना इस नीति और इस पर किये गए सार्वजनिक निधि के खर्च को व्यर्थ कर सकती है और विकासशील दिमागों के लिए खतरनाक भी साबित हो सकती है। हम उम्मीद करते हैं कि आप इस महत्वपूर्ण विषय पर हमें प्रतिक्रिया देंगे और हम आगे इस विषय पर और चर्चा कर पाएंगे।

प्रार्थी,

हस्ताक्षरकर्ता (PTO)

फरवरी 22, 2013

कॉपी:

1. मुख्यमंत्री, राजस्थान सरकार
2. शिक्षा सचिव, राजस्थान सरकार
3. निदेशक, प्राथमिक शिक्षा, बीकानेर, राजस्थान
4. निदेशक, SIERT, उदयपुर
5. अध्यक्ष, माध्यमिक शिक्षा बोर्ड, अजमेर
6. सचिव, माध्यमिक शिक्षा बोर्ड, अजमेर
7. निदेशक, S.S.A., राजस्थान

संलग्न:

1. शिक्षा में आईसीटी पर राष्ट्रीय नीति, मार्च 2012 (अंश)
2. मानव संसाधन विकास मंत्रालय 12 वीं पंचवर्षीय योजना के दिशा निर्देशों, जून 2012 (अंश)
3. खोलने के मानकों पर ई – गवर्नेंस, सूचना प्रौद्योगिकी विभाग, भारत सरकार में नीति

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National Policy

on

Information and Communication Technology (ICT)

In

School Education

Department of School Education and Literacy
Ministry of Human Resource Development
Government of India
2012

Contents

5.2   School Management Information System (School MIS)

5.2.1   A nation wide network will be established in which schools, teachers, students, school managers, and the community at large participate. This implementation will include the School Management Information Systems (School MIS); digital repositories of tools, content and resources; professional development and continuing education platforms; and guidance, counselling and other student support services.

5.2.2   School MIS will emerge as a single window clearing house on all information related to the secondary school system. The information will facilitate research and analysis activities and guide decision making at different levels in the education system, contributing to enhanced efficiencies.

5.2.3   The scope of information to be collated by the MIS will be broad and include student and teacher tracking, particularly for their academic needs. The norms will also define standards of technology including language fonts, word processors, technical dictionaries, etc. Open standards facilitating universal access to information, content and resources will be ensured.

6. ICT Infrastructure

There will be two types of Infrastructure:

- ❖ Core ICT Infrastructure
- ❖ Enabling Infrastructure

6.1 Hardware

6.1.1   The States will establish state of the art, appropriate, cost effective and adequate ICT and other enabling infrastructure in all secondary schools

6.1.2   Based on the size of the school, needs of the ICT programme and time sharing possibilities, States will define an optimum ICT infrastructure in each school. Not more than two students will work at a computer access point at a given time. At least one printer, scanner, projector, digital camera, audio recorders and such other devices will be part of the infrastructure.

6.1.3   Each school will be equipped with at least one computer laboratory with at least 10 networked computer access points to begin with. Each laboratory will have a maximum of 20 access points, accommodating 40 students at a time. The ratio of total number of access points to the population of the school will be regulated to ensure optimal access to all students and teachers.

6.1.4   In composite schools, exclusive laboratories with appropriate hardware and software will be provided for the secondary as well as higher secondary classes.

6.1.5   In addition, at least one classroom will be equipped with appropriate audio-visual facilities to support an ICT enabled teaching-learning.

6.1.6   Appropriate hardware for Satellite terminals will be provided to selected schools in a progressive manner.

6.1.7   Computer access points with internet connectivity will be provided at the library, teachers' common room and the school head's office to realise the proposed objectives of automated school management and professional development activities.

6.1.8   ICT enabled education can be significantly enhanced and the range of classroom practices expanded with the introduction of digital devices like still and video cameras, music and audio devices, digital microscopes and telescopes, digital probes for investigation of various physical parameters. These will also form a part of the infrastructure. States will make appropriate choices and promote the use of such devices in classrooms.

6.2 Network and Connectivity

6.2.1   All computers in the school will be part of a single local area network to enable optimum sharing of resources. In addition to the laboratory, internet connections will also be provided at the library, teachers' common room and the school head's office.

6.2.2   Each school will be serviced with broadband connectivity capable of receiving streaming audio and video, a range of digital learning resources and interactive programmes. The number of computers given internet connectivity will be governed by the available bandwidth, in order to ensure adequate speeds. A mechanism to have offline access to internet content will be set.

6.2.3   Teachers and students will be educated on issues related to the safe use of internet Firewalls and other security measures will be implemented to guard the school network against cyber attacks and misuse of the ICT facilities. Appropriate guidelines for network security will be developed.

6.2.4   An EDUSAT network will be planned at each state with interactive terminals (SIT) and recieve only terminals (ROT)

6.3 Software

6.3.1   A software environment favouring a pedagogy of learning which promotes active learning, participatory and collaborative practices and sharing of knowledge is essential to nurture a creative society. Free and Open Source Software – operating system and software applications will be preferred in order to expand the range of learning, creation and sharing.

6.3.2   A wide variety of software applications and tools, going well beyond an office suite is required to meet the demands of a broad based ICT literacy and ICT enabled teaching learning programme. Graphics and animation, desktop publishing, web designing, databases, and programming tools have the potential of increasing the range of skills and conceptual knowledge of the students and teachers. A judicious mix of software applications will be introduced in schools.

6.3.3   Creation and widespread dissemination of software compilations, including specialised software for different subjects, simulations, virtual laboratories,

modelling and problem solving applications will be encouraged. These will be distinct from multimedia packages and digital learning resources.

6.4 Enabling Infrastructure

6.4.1   The enabling infrastructure required to efficiently maintain the ICT facility will be defined, established and maintained.

6.4.2   Regular and regulated supply of electricity, appropriate electrical fixtures, adequate power backup and support, including alternate sources of energy, where needed, will be ensured. Students and teachers will also be trained in the safe use of electrical outlets and fittings.

6.4.3   Physical facilities like an adequately large room, appropriate lighting and ventilation, durable and economic furniture suitable for optimisation of space and long hours of working will be established. Alternate layouts and arrangements facilitating interactions amongst students and with the teacher will be encouraged.

6.4.4   Adequate safety precautions and rules for use will be established. Each laboratory will be equipped with a portable fire extinguisher and students and teachers trained in its use. An appropriate fire drill will also be implemented.

6.4.5   All the equipment and resources will be secured from theft and damage. They will also be covered under an appropriate insurance policy against theft and damage.

7. Digital Resources

7.1 Digital Content and Resources

7.1.1   The state shall endeavour to provide universal, equitable, open and free access to ICT and ICT enabled tools and resources to all students and teachers. All digital learning resources and software resources will conform to the National Policy on Open Standards of the Government of India (http://egovstandards.gov.in).

7.1.2   Given the diversity of the country's educational, linguistic and social situation, there exists a need for a wide variety of digital content and resources for different subjects, curriculum, ages/grade levels and languages. Unicode fonts will be used to ensure universal access, compatibility and amenability to transliteration and translation.

7.2 Development of Content

7.2.1   Use of interactive ICT tools for teaching and learning, e.g. virtual laboratories will be promoted. The development of digital learning resources in the form of e-books, animations, lessons, exercises, interactive games, models and simulations, videos, presentation slides, plain text materials, graphics, or any combinations of the above, will be encouraged. Use of digital resouces should be harmonised with the requirements of the curriculum and supplement it.

7.2.2   The proposed web based digital repositories will host a variety of digital content, appropriate to the needs of different levels of students and teachers.

7.2.3   Raw content resources like photographs, video, audio and animations will be remodelled to develop multimedia learning objects.

7.2.4   Teachers and students will be encouraged to develop digital learning resources collaboratively and contribute to the proposed digital repositories, collectively owning it.

7.2.5   Textbooks, teachers'/students' guides, question banks, FAQs, laboratory manuals, problem sets, activities, notes and a variety of other print based learning resources available in the public domain will be digitised and deployed on the national and state level web based digital repositories.

7.2.6   Educational standards and instructional designs for a variety of digital content and resources will be widely disseminated to enable development of quality digital content, including interactive multimedia materials and learning objects.

7.3 Sharing and Dissemination of Digital Content

7.3.1.   Widespread sharing and dissemination of digital content will promote infusion of ICT into classroom practice. Suitable open standards for interoperability, web based sharing and appropriate norms for free access will be defined to catalyse use of digital content and resources.

7.3.2   Collections of digital content and resources will be deployed on web based digital repositories, which will be universally accessible. Private Public partnership projects for the same could be encouraged. State level and National level repositories will be developed and maintained. Emphasis will be placed on multi lingual digital learning resources development in State Regional Languages with facilities for translation to other languages so as to optimise time, effort and cost. Content Delivery Networks will be developed to enable transmission of content from multiple locations.

7.3.3   National level organisations like Central Institute of Educational Technology (CIET), National Council of Educational Research and Training (NCERT). Indira Gandhi National Open University (IGNOU) and State level organisations like State Institutes of Educational Technology (SIETs) will play a proactive role in developing and sharing of digital content and its source code to support wide scale adaptations. They will also support the capacity building activities of teachers in digital content development and usage.

7.3.4   Content developed by state funded projects and programmes will be deployed along with source code under appropriate licensing norms (like the creative commons) to facilitate open and free access to these resources. This will also help avoid duplication of efforts in different States.

7.3.5   Digital content, software applications and resources developed by private individuals, agencies or groups to be used in the school system will be subject to validation for accuracy of content and pedagogical suitability by organisations like NCERT, SCERT, and Boards of Secondary Education. A mechanism for procurement along with source code and rights will be evolved.

7.3.6   Teachers and students will be oriented to prevailing copyright regimes, different types of restrictions on reuse of content and the need to respect copyright.

Teachers and students will also be educated about alternate forms of licences like the creative commons and encouraged to use them.

7.4 Role of School Library

7.4.1   The library in the school will search, collate and categorise digital resources and make them available to the teachers and students. For instance, the school library will develop lists of web resources or advisories for ICT usage or teaching learning of different subjects. The school library will be automated for facilitating access to a variety of digital resources. An automated library with internet access will catalyse the use of digital resources in all class rooms.

8. Capacity Building

8.1 Capacity building of In-service Teachers

8.1.1   Capacity building of teachers will be the key to the widespread infusion of ICT enabled practices in the school system. A phased programme of capacity building will be planned. In service training of teachers will comprise of Induction Training as well as Refresher Courses. The induction trainings will be imparted by the Regional Institutes of Education of the NCERT, State Councils of Educational Research and Training (SCERTs) or such other institutions of the Central and State Governments and will preferably be completed before the commencement of the academic year. The refresher trainings will be carried out every year to enable teachers to share, learn and keep abreast of the latest trends in ICT based teaching learning processes. The induction training will be followed by teacher's evaluation to ensure that the minimum competency is achieved.

8.1.2   Training in ICT will be integrated with general training programmes organised for teachers and school leaders at all levels in order to popularise its use and to demonstrate effective practices in ICT.

8.1.3   Beginning with an initial sensitisation through ICT operational skills and ICT enabled subject teaching skills, teachers will become part of online professional groups (e.g. English teachers association) to continue their education, pool in their resources and actively contribute to the strengthening of domain specific knowledge within the country. The forums will also facilitate continuous development of ICT skills introducing them to tools and resources in different subjects / specialisations as well as create and share learning resources in those subjects.

8.1.4   Teacher participation in the digital content development process will catalyse its broad based usage in the classrooms. Teacher capacities will be developed in instructional design, selection and critical evaluation of digital content, and strategies for effective use of digital content to enhance student learning.

8.2 Capacity building through Pre-service Teacher Education

8.2.1   Teacher educators will be suitably oriented and trained to use ICT in their pre-service teacher training programmes. They will also be expected to enable pre-service teachers to be sensitised to and practice the use of ICT.

8.2.2   All pre-service teacher education programmes will have a compulsory ICT component. The existing curricula for pre-service teacher's training will be revised for including appropriate and relevant applications of ICT. All teacher trainees passing out of teacher education programmes will obtain adequate levels of competency in ICT and ICT enabled education (see 4.2 above). This proficiency will gradually form a part of the eligibility criteria for teacher appointments.

8.2.3   National Council for Teacher Education (NCTE) has already laid down guidelines about availability of ICT infrastructure in each such training institution. NCTE would prescribe appropriate curriculum in ICT corresponding to the ICT curriculum in schools, to be revised periodically, for such teachers.

8.3 Capacity building of School Heads

8.3.1   School heads will play an important role in establishment and optimal utilisation of ICT and ICT enabled education practices in the school. All school heads will undergo appropriate orientation in ICT and ICT enabled education training programmes. This will also help them in building up digital resources for the school.

8.3.2   School heads will also be trained in processes leading to automation of administration, management and monitoring of the school system and will play a proactive role in the implementation of School Education Management Information System (SEMIS).

8.3.3   School heads will be oriented to ensure the upkeep and safety of the ICT infrastructure and the optimum use of the ICT facilities.

8.4   Capacity building of State / District Education Department Personnel
8.4.1   States / Districts Education Department personnel at all levels will be oriented to infuse ICT into their work. They will also be oriented to various aspects related to the ICT implementation at the school level, SEMIS and sustenance of the ICT infrastructure.

8.4.2   School clusters encompassing neighbourhood schools will be established for sharing and learning from each other aiming to hasten the process of integration of ICT into all aspects of the school system.

9. Implementing and Managing the Policy

9.1 Programme Monitoring and Evaluation Group (PMEG)
9.1.1   Programme Monitoring and Evaluation Group (PMEG) of the Department of School Education & Literacy, Ministry of HRD, Government of India, will be tasked with the overall responsibility of guiding the implementation of the ICT programme in schools across the country. The PMEG may set up task groups and invite institutions or established professionals with substantial expertise in that sector to develop norms, specifications, guidelines, evaluation reports, white papers etc. to guide the States in implementing the ICT programme.

9.2 Inter-ministerial Group
9.2.1   An Inter-Ministerial Group consisting of members from the Ministry of HRD, Ministry of Communications and Information Technology, Ministry of Information and

Restructuring and Reorganization of the Centrally Sponsored Scheme on Teacher Education

Guidelines for Implementation

June, 2012

Government of India
Ministry of Human Resource Development
Department of School Education and Literacy

सत्यमेव जयते
Government of India

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NCTE

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Chapter IX : Integrating ICTs with teacher education

ICT is a very broad domain, and affects all aspects of life, the socio-cultural, the political and the economic. Since education is concerned with preparing learners to become responsible citizens, there is a great need for student-teachers to acquire a basic understanding of ICTs, including the Internet. Hitherto, focus has been on basic proprietary softwares; however, we need to expose student-teachers to a larger gamut of ICTs, so that they have basic understanding and can develop skills in areas that interest them. The course curriculum should hence cover the following :

(a) Basic hardware knowledge - Computers – laptops, net-books, tablets, radio and audio recorders, camera, Printer/peripherals; Cell phones
(b) Basic software knowledge - Public operating systems (e.g. GNU/Linux) - virus free, free of cost/free to share which support most languages, and basic software applications that are also free to share, modify and use for office automation, web browsing etc.
(c) Basic knowledge of Internet and web based tools and resources including of cyber security – avoiding dangers and risks as well as basic website and web tools use (for creating and maintaining institutional resource portals etc)
(d) Larger socio-cultural, political and economic implications of the emerging network society, an effect of ICTs.

9.2   The goal in ICT literacy must be to expose teachers to a wide variety of ICT resources – hardware, software as well as digital learning resources . This requires an emphasis on using available free / public digital resources. Teachers must not treat ICTs as a black box – they should be taught to install even the operating system, open up hardware to study components. Programs that have done this (e.g. Kerala's IT@schools programme) have seen enormous confidence developed in teachers. Learning to install software and freely installing it on multiple computers (without such act being a violation of law) serves as a significant inhibition destroying process and encourages teachers to begin a journey of learning in the digital world. Teachers become learners and teachers instead of being consumers/users who have no idea and no right to study, share or customise resources. Inexpensive computers / devices that support access and participation in the digital space, need to be promoted on large scale.

ICT Aided Learning / integrating ICTs into subject teaching-learning

9.3   The biggest drawback so far in ICTs has been to treat it as a stand-alone subject. However, ICT it is a new and powerful method for mediating teaching-learning and hence needs to be integrated into different subjects. To integrate, the steps of accessing, reviewing, creating and sharing resources are to be structured into formal curricular experiences.

9.4   Existing digital resource repositories from governments and NGOs including audio resources (EDC), video resources, animation movies etc. should be made widely accessible. It is important to make the resources available in district repositories linked to state repository. Student-teachers also need to learn how to access the world wide web for resources, including principles governing quality, authenticity of resources, rules of fair use etc. Student-teachers need to integrate ICTs into their subject teaching-learning, using varied digital methods to create learning resources, using public educational software applications, such as

(i)   Maths – Geogebra, Bruch, K Turtle, carMetal
(ii)   Languages - SCIM (multi-language typing), K Hangman etc. (language), K Anagram, K Letters
(iii)   Science – K Stars, Stellarium etc (astronomy), Kalzium, STEP, PHET etc
(iv)   Social Science - Marble (geography), KGeography, OpenMaps
(v)   other subjects - Freemind (creative thinking) for creating concept maps
(vi)   web tools like wiki, blogs
(vii)   digital tools like video camera and video/photo/audio software applications including recordmydesktop, Kdenlive, Audacity etc. as well as CBTs such as spoken tutorials (www.Spoken-Tutorial.org)

Blended learning in Teacher Education

9.5   Complementing physical workshops/meetings with virtual interactions over a mailing-list or an e-learning forum such as moodle provides new models of teacher education through ICTs. For instance, the TISS MA Education program (www.tiss.edu/maee) which is 5+ years old is able to offer the program to students across the country and also access faculty from across the country, because each of the four semesters consists of a 3 week contact period (on-site) followed by a 12 week course transaction over Moodle. Since Moodle is a public software, the course has freely customized it for its own specific requirements. Similar programs need to be offered by DIETs to teachers which can allow learners to learn at their own pace (relatively) and also reach a larger number of teachers than is possible through purely physical interactions.

9.6   Blended models also allow for greater possibilities for addressing the diverse and heterogeneous learners needs, since the teaching-learning is not restricted to the classroom and virtual learning spaces allow for greater one-to-one interactions, at space and time convenient to the teacher-educators and student teachers. Thus blended models can allow for catering to diverse learning needs, contexts and aspirations.

9.7   It is also important to note that the distant modes have been an integral part all over the globe in Teacher professional Development and distance education is merging

into blended learning, more effectively combining contact period and on-line interactions. In the context of teacher education, distance learning has more than one aim and audience. It has been used as a pre-service teacher preparation method with "teacher candidates," mostly with extensive face-to-face preparation. In developing and developed-country contexts, it has been deployed as an in-service vehicle to fulfil a mandate to upgrade the knowledge, skills and qualifications of an existing teaching force. Finally, and predominantly within developed-country contexts, distance education, mainly in the form of web-based education, serves as a vehicle for continuing education, offering enrichment, enhancement and additional certifications for teachers who have attained at least a minimum level of certification in their content/grade-level area. The use of blended models needs to be encouraged in both in pre-service, in-service

Use of Public Software in Teacher Education

9.8   Since the adoption of ICTs in education is essentially an educational issue, rather than a technological one, pre-service teacher education policy and program need to be anchored in sound educational perspectives. Curriculum is the primary process of directing teaching towards fulfilling educational aims and digital learning resources (content) and digital learning tools/ processes (software applications) which constitute curricular resources, need to comply with curricular principles. An important principle of education is that curricular resources need to be publicly owned, so that they are freely available to teacher educators, teachers and students without restrictions. In the case of traditional print media (books), the public education system does not use proprietary curricular resources, since that prevents the schools, teachers and students from freely sharing the resources and from customizing and using them as per their local needs. Proprietary software and content forces the teacher to be a 'mere user'; treating these tools as a 'given'. Teachers, schools and the entire public education system become completely dependent on the vendor for any changes, modifications, enhancements / customizations to these tools and have no right to freely share these resources with one another. Thus allowing for use of privatized digital learning processes (in the form of proprietary software or content) would be detrimental to education and the public education system should use only publicly owned curricular resources.

9.9   There are free software applications for all the areas where proprietary software applications have been used in schools. At a systemic level, public software has been used in a successful "ICT@schools" program in India – the Kerala IT@SchoolsIT@Schools, which is being emulated in Gujarat. The 'Subject Teacher Forum' program of RMSA, Karnataka uses public educational software for mathematics, science and social science teachers.

9.10 In addition, use of publicly owned software has other important advantages. Since publicly owned software can be freely shared, the costs of using freely shareable

software applications would be much lower specially for implementing at a large scale, where support systems are feasible to build. An IIM-Bangalore study estimates that on a conservative basis, Kerala IT@SchoolsIT@Schools program has saved Rs 50 crore on software license fees and India would save Rs 20,000 crore each year by adopting the same.

9.11 The GNU/Linux publicly owned operating system is virus-resistant and this can hugely reduce maintenance and support efforts and resources. A large number of computers in educational institutions tend to be unused due to virus issues and using GNU/Linux would increase infrastructure availability. A large number of educational software applications can be bundled with the GNU/Linux operating system which means they can be available to teachers and schools in a simple single installation process. The Kerala, Karnataka and Gujarat programs use the Ubuntu GNU/Linux operating system which is simple and easy to use, bundled with the educational tools.

9.12 Thus education system should encourage the use of digital tools and resources that are freely shareable and modifiable, in line with other curricular resources and discourage the use of software or content which is privately owned and which teachers and education system is legally and technologically prevented from sharing/customizing. Some of the education tools for various subjects and Language are suggested in Annexure XIII.

Suggested Roadmap for ICT integration into processes of DIETs, etc.

Activity	Resources required	Indicative costs (for a DIET with 100 students)
Create / upgrade required ICT infrastructure in each institution	Computers, Internet, camera, audio recorders, storage devices. Broadband wireless connectivity	100 access devices would cost 20,00,000 and this can be acquired over a 3 year period. Other costs would not be more than couple of lakhs. Various programs of central and state government provide budgetary support for acquiring ICT infrastructure
Build basic ICT literacy capacities in teacher-educators	Master resource persons to train the teacher-educators	Training costs, based on a blended model, combining 10 days workshop based, spread over 3-4 phases and a on-line email/portal based interactions
Build capabilities in teacher-educators	Master resource persons to train	Training costs, based on a blended model, combining 10 days workshop

to use ICTs for their subject teaching-learning	the teacher-educators	based, spread over 3-5 phases and a on-line email/portal based interactions
Build capabilities in teacher-educators to use ICTs for their own continuous and life-long professional development	Master resource persons to train the teacher-educator	Annual program of training for teacher-educators, on a blended model, combining 5 days workshop based, spread over 1-2 phases and a on-line email/portal based interactions
Teacher-educators to work with student-teachers and teachers to support their layered learning for ICT mediation in teaching-learning	Teacher-educators	Part of regular PSTE program.
Maintenance of the infrastructure	Lab attendant, consumables	Around 15% of the capital costs should be provided for maintenance and upgrade of infrastructure
Maintaining a web-portal /e-learning system (can be done as a second phase, after basic capacity building of all teacher-educators in first phase)	One web administrator. Resources for the portal would be created by the faculty as a part of their regular teaching and research work.	Apart from the web administrator, the costs of maintaining the portal would be around 10,000 per year.
Offering blended courses	Course creation and administration costs – largely part of people costs and should subsume into regular activities of the institution	Designing courses offered on a blended model with a large virtual component can be coordinated by SCERT with identified DIETs. Courses and faculty can be virtually shared across institutions

Components of Central assistance under the Scheme

9.13 The central aim of introducing technology in teacher education is to develop and promote openness for new thinking in an atmosphere of innovation through introduction of methods that are interactive, non-threatening and self paced – and move away from mechanical text-based, chalk and talk methods. Integrating ICT into teacher education is also necessary for bridging the digital divide between Government and private teachers, rich-poor, urban-rural, by providing opportunities to effectively use technology to further educational objectives. This will entail hardware support, namely provisioning for satellite transmission facilities in the DIETs. It will also entail provisioning for software support for developing content and orientation of teacher educators and teachers. Following assistance would be made available:

(i)   One-time assistance upto Rs 5 lakh per DIET for hardware support;
(ii) Development of 50 teacher modules @ Rs 10 lakh per module (to be developed by the Central Government);
(iii) Upto Rs 70,000 for hub/switch;
(iv) One-time training/orientation of teacher educators upto Rs 1 lakh per DIET;
(v)   Cost of additional support, including maintenance upto Rs 2 lakh per DIET per year.

9.14 Several SCERTs and DIETs already have the infrastructure support, including EDUSAT facilities and therefore, above provisioning would be limited only to those institutions which do not have such infrastructure and facilities at present.

~ 1865

Government of India
Ministry of Communications and Information Technology
Department of Information Technology
Electronics Niketan
6, CGO Complex
***

New Delhi-110003
November 12, 2010

Notification

Policy on Open Standards

No. 2(32)/2009/EG-II WHEREAS, Department of Information Technology (DIT), Ministry of Communications and Information Technology, Government of India (GoI) is driving the National e-Governance Plan (NeGP), which seeks to create the right Governance and institutional mechanism, implement a number of Mission Mode Projects at the Center & State government

AND WHEREAS, Standards in e-Governance is considered priority activity, which will help ensure sharing of information and seamless interoperability of data across e-Governance applications and also creation of Institutional Mechanism under NeGP to evolve/adopt Standards for e-Governance

AND WHEREAS under NeGP, GoI is promoting the usage of Open Standards to avoid any technology lock-in

AND WHEREAS a well laid Policy on Open Standards would play a critical role in adopting / evolving the Standards for the rapid, effective and efficient growth of e-Governance in India
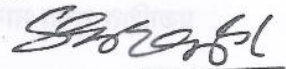
AND WHEREAS the Competent Authority on Standards has approved the Policy on Open Standards

NOW, this Department hereby notifies the use of Policy on Open Standards published on http://egovstandards.gov.in for the selection of Single and Royalty-Free (RF) Open Standard for a specific purpose with in a domain for e-Governance w.e.f the date of notification.

Issued - through Speed Post.
with Hindi version
12/11/10

(S.S. Rawat)
Joint Director

O/c

To
The Manager
Government of India Press
Faridabad (Haryana)   : Alongwith Hindi Version.

Copy for information to:

1.   All Secretaries, Government of India
2.   Chief Secretaries of all the State Governments
3.   Secretary (IT) of all the States.

(S.S. Rawat)
Joint Director

भारत सरकार
संचार और सूचना प्रौद्योगिकी मंत्रालय
सूचना प्रौद्योगिकी विभाग
इलेक्ट्रॉनिक्स निकेतन
6, सीजीओ कॉम्प्लेक्स
****

नई दिल्ली
12 नवम्बर, 2010

अधिसूचना

मुक्त मानदण्डों पर नीति

सं. 2(32)/2009-ईजी-II जबकि, सूचना प्रौद्योगिकी विभाग, संचार और सूचना प्रौद्योगिकी मंत्रालय, भारत सरकार राष्ट्रीय ई-शासन योजना (इनईजीपी) चला रहा है, जिसमें सही शासन और संस्थागत तंत्र की स्थापना करने, केन्द्र और राज्य सरकार में कई मिशन मोड परियोजनाएँ कार्यान्वित करने की बात की गई है
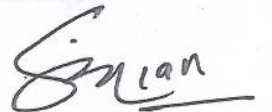
और जबकि, ई-शासन के मानदण्डों को प्राथमिकता प्राप्त कार्यकलाप माना गया है, जिससे सूचना के आदान-प्रदान और ई-शासन अनुप्रयोगों में डेटा के अविच्छिन्न अन्तर-प्रचालन में तथा ई-शासन के लिए मानदण्ड बनाने/अपनाने के लिए एनईजीपी के अंतर्गत संस्थागत तंत्र की स्थापना करने का भी सुनिश्चय करने में सहायता मिलेगी

और जबकि, एनईजीपी के अंतर्गत भारत सरकार किसी भी प्रकार के प्रौद्योगिकीय अवरोधों को दूर करने के लिए मुक्त मानदण्डों के इस्तेमाल को बढ़ावा दे रही है

और जबकि, मुक्त मानदण्डों पर यथोचित रूप से निर्धारित एक नीति भारत में ई-शासन के तीव्र, प्रभावशाली एवं सक्षम विकास के लिए मानदण्ड अपनाने/तैयार करने में एक महत्वपूर्ण भूमिका निभाएगी

और जबकि, मानदण्डों पर सक्षम प्राधिकारी ने मुक्त मानदण्डों संबंधी नीति को अनुमोदित कर दिया है

अब, यह विभाग एतद्द्वारा अधिसूचना की तारीख से ई-शासन के लिए एक डोमेन के अंतर्गत विशिष्ट प्रयोजन के लिए एक ही और रायल्टी मुक्त (आरएफ) मुक्त मानदण्ड के चयन के लिए http://egovstandards.gov.in पर प्रकाशित मुक्त मानदण्डों संबंधी नीति को अधिसूचित करता है ।

(एस.एस.रावत)
संयुक्त निदेशक

सेवा में,

प्रबंधक
भारत सरकार प्रेस
फरीदाबाद (हरियाणा)

सूचनार्थ प्रतिलिपि :
1. भारत सरकार के सभी सचिव ।
2. सभी राज्य सरकारों के मुख्य सचिव ।
3. सभी राज्यों के सचिव (सूचना प्रौद्योगिकी) ।

(एस.एस.रावत)
संयुक्त निदेशक

Technical Standards for

Interoperability Framework for E-Governance in India

(Phase-I)

Draft Version 0.6

November 2010

Government of India
Department of Information Technology
Ministry of Communications and Information Technology
New Delhi – 110 003

Table of Contents

5.1 Domain-wise List of Technical Standards

5.1.1 Presentation And Archival Domain

The Presentation part of this Domain provides the interface to the user for accessing information. The Archival part of this Domain provides interface for storing and retrieving the data.

Sl. No.	Interoperability Area	Standard / Specification	Standards Body	Status of Standard as per "Policy" O-Open I-Interim A-Additional	Maturity Level M-Matured E-Evolving	Enforcement Category (M-Mandatory R-Recommended)	For additional information, refer the Table No. in this column
1	Document type for Simple Hypertext Web Content	HTML 4.01 (ISO/IEC 15445:2000)	W3C, ISO/IEC	O	M	M	5.2.2
2	Document type for Complex, Strict Hypertext Web Content (XML or non-XML)	XHTML v1.1	W3C	O	M	M	5.2.14
3	Style Sheets (to define Look & Feel of Web-page)	CSS 2.	W3C	O	M	M	5.2.1
4	Extensible Style Sheets (to transform format and addressing parts of documents)	XSL 1.1	W3C	O	M	M	5.2.18
5	Document Type for Editable documents (with formatting)	ODF (OpenDocument) v1.0 ISO/IEC 26300:2006	ISO/IEC	O	M	M	5.2.4
6	Document Type for Presentation	ODF (OpenDocument) v1.0 ISO/IEC 26300:2006	ISO/IEC	O	M	M	5.2.4
7	Document Type for Spreadsheet	ODF (OpenDocument) v1.0 ISO/IEC 26300:2006	ISO/IEC	O	M	M	5.2.4
8	Document type for Non-editable documents	PDF 1.7 (ISO 32000-1:2008)	ISO/IEC	I	M	M	5.2.7
9	**Graphics –** Raster Image (Lossy Compression)	JPEG2000 Part 1	ISO/JPEG Committee	I	M	M	5.2.3
10	**Graphics –** Raster Image (Lossless Compression)	PNG ISO/IEC 15948:2004	W3C ISO/IEC	O	M	M	5.2.9
11	Audio Compression	OGG Vorbis I	Xiph Foundation	O	M	M	5.2.6
12	Video Compression	Ogg Theora I	Xiph Foundation	O	M	M	5.2.5
13	Image Storage/Archival	PNG ISO/IEC 15948:2004	W3C ISO/IEC	O	M	M	5.2.9
14	Scanned Document	PDF/A (ISO 19005-	ISO/IEC	O	M	M	5.2.8