Workshop Report

Public Sector Software and FOSS in Education

May 27- 29, 2010, Kochi

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1 Summary

Practitioners and policy makers from India and some other South Asian countries met in Kochi, Kerala, India on 27-29 May, 2010 for the International Conference on 'Software in the Public Sector, with focus on Public Education', organised by UNESCO and the Government of Kerala. This discussions built on the draft ‘Guiding principles for policy on software for the public sector’, discussed in Bangalore as covered critical areas such as open standards, FOSS educational tools. The participants also visited schools to understand the features of the IT@Schools program. The objective was to finalise discussions on public sector software so that the public sector can fulfil its mandate to the society.

At the conclusion of these deliberations, the participants released the 'Kochi Declaration on Public Software', with the commitment to support the adoption of Public Software Principles in public agencies in India and other South Asian countries. The declaration recognises that the unique context of public software and its objectives of ensuring equity and social justice has implications for ensuring universal access to such software, as well as transparency and participation by the citizens in its design and use, and urges public institutions in these countries to adopt and promote Public Software. The website of the Public Software Centre, which aims to be a resource portal for public sector software was also launched in the conference.

Some of the recommendations made during the conference were that Public Software needs to be freely shareable amongst all members of society to ensure universal access to public services through the use of ICTs that requires universal access to software. Furthermore, it is essential that Public Software be open to permit public overview, participation and audit. . It was also suggested that Public Software must use open standards that ensure interoperability, and portability across multiple media.

Public Software requires 'strategic and substantive public ownership' for which ownership of source code is necessary but not sufficient. To this end, it must be ensured that the public agency commissioning a software take up complete ownership. This ownership should be real and not nominal providing the concerned public agency with full ability to share and modify the software as required in perpetuity. This requires adequate and relevant capacity building of public functionaries, stakeholder participation in design and development, componentisation of the development process, as well as required user and program documentation. The strategic and substantive public ownership can only be realised when aspects of documentation, content, connectivity, data security and citizen privacy meets the test of public sector imperatives.

National and state repositories for Public Software resources must be established at national and sub-national levels that support re-use of applications. A common repository will also encourage sharing of softwares among the states that will be cost efficient for the Government. Eg: Language interfaces can be changed for different states for the same computer aided learning systems. Similarly, softwares for Birth Certificate, death certificate and property tax collection by the Municipalities could be used across many municipalities.

Public Education has been identified as not just a service to the public but is rather instrumental in creating a public through knowledge as opposed to passive consumption of

content. Digital learning material should not be procured on a royalty basis and any exception will need to be justified

Furthermore, the concluding day held several demonstrations by the teachers under the IT@SCHOOL project on the use of software tools in classroom teaching methodologies. In addition, Mr Davide Storti from UNESCO-Paris inaugurated the Educational website for Kerala. The events of the three days have been given in further details in the following pages.

2 Day 1: Visit to Schools in Kochi

2.1 Background

Kerala has been a phenomenal success story with regards to actively implementing ICT in its schools for the past 5 years. After having introduced ICT in its pedagogy, now the state is looking forward to designing its curriculum for various standards by integrating ICT in its structure. The objective was to understand how these schools had applied the system of ICT effectively and how it can be used in other schools. The challenges in the process of adopting ICT were also noted so as to provide solutions that would better facilitate the process.

All the schools that were visited in Kochi were either Government run or Government aided in nature. The students in these schools belonged to the lower socio-economic end of the society. The schools were selected on the basis of variety in the use and implementation of ICT techniques along with its geographical accessibility and gender gradation. Govt. VHSS Marady East; Govt. HSS for Girls, Ernakulam; Govt. HSS, South Ezhippuram; and V.H.S.S., Irimpanam in Kochi are the schools that were visited.

Infrastructure available in schools

In terms of ICT, 90% of the Government schools were well equipped with various tools and facilities. The average computer student ratio in the schools was approximately around 1:30. Multimedia tools were effectively used in educational discourses by ICT trained teachers. However, not all teachers were efficient in the use of these tools.

Observed effect on children

The students were more engaged in the process of classroom learning in addition to being highly adapted to the use of ICT tools; actively participating in hardware maintenance and development. The ICTs also encouraged students to be active contributors in technical forums in various forms rather than being passive users. In an instance, a student with the help of his teacher developed a digital microscope using the available resources. Yet still, another set of students modified the interface of Tuxpaint to their local language. The IT coordinators have better facilitated the adoption and use of ICT among students by encouraging them to understand the logic behind the working of the keyboard and other computing techniques.

Challenges faced

The crisis that most schools faced was in the process of effective teacher's training to facilitate the shift towards ICT tools effectively. In some cases, language was found to be a cause of concern as most of the information available online is usually in English and the shift to English as the pre-dominant communication platform is relatively poor. However, the teachers showed great enthusiasm towards contributing to the progress in students' education

Retention of students is another vital crisis. Though the grading system does not allow any student to fail as the lowest grade that one can obtain is D+, well performing students usually have migratory tendencies towards larger schools. Poverty and inaccessibility of schools due to poor infrastructure and transport facilities in remote areas has propelled another form of school drop-outs leading to poor attendance and incomplete education among children of the state.

Post the visit to the schools, all the groups convened at the regional resource centre, Edapally, Kochi.

2.2 Visit to Regional Resource Centre, Edapally, Kochi

The Regional Resource Centre in Edapally is an initiative by the Department of General Education, Government of Kerala to train the teachers in the use of multimedia and ICT tools while teaching. All the teachers unedr the programme turned up on voluntary basis. The teachers are trained in the use of various free softwares tools and how to employ them various to create content for classroom discourses.

A discussion on the observations made on the field then followed the event.

2.3 Debrief of the visit by the field trip coordinators

Mr. Gurumurthy Kasinathan, Director, IT for Change tried to address the issues of low student turnout despite the provided ICT facilities. States need to have a mechanism in place to track children, determine the causes of drop-out and then address the problems while negotiating with their guardian to ensure their complete education. Better infrastructure and transportation facilities in remote areas will enhance student attendance. Also, it is vital that infrastructural road maps be developed.

Y Kiran Chandra said, Parents Teachers Association can be the chief political wheel that could facilitate the optimisation of resources. Teachers ought to focus on reducing dependency on support staff. All the teachers and students need to share knowledge in the form of tutorials or presentations for cross benefit and peer reviewing. The IT@Schools could then collate the data and provide the information for global consumption.

Smt. Jayalaksmi Chittoor suggested that for any hardware issues, a log of the service complaints made through an annual maintenance contract be maintained by the school to keep a track of the lost time for repairs. Institutions must also keep one of the computers as standby for using in times of repairs. Power failure can be combated by alternative energy conservation schemes. The gaps between access to applications and the usability of ICT in education needs to be verified and bridged. IT tuitions could be part of future planning to enable students to take competitive exams while Wiki editing tools can be used for developing lessons and sharing.

There needed to be systems in place that could measure the impact of workshops conducted to facilitate the use of ICT. She also said that better interaction between DIET and IT@ School needs to be encouraged to address these issues better.

Dr. Piush Antony from UNICEF suggested sharing of knowledge and resources by the teachers using ICT while developing the course curriculum. Motivated teachers who have adapted the skills faster than the others should be allowed to take the leadership in inducting their colleagues.

Students comfortable and efficient with the use of ICT must utilize the opportunity of their skills and know-how to train students from other schools who lack the necessary guidance and thus build a network where they can seek for solutions from their peers. This would substantially bring down the level of dependency and demand on teachers. Children safety can be ensured via policies to determine safe exposure to content on the net, in addition to

censorship using firewalls. Alumni associations can help in student counselling and training to provide students with skills, focus and road maps towards their future career plans.

This was followed by a performance of classical music organised by Department of Education, Kerala. Various panellists met on the second day of the workshop to determine the need for policies on Public Software.

3 Day 2: Finalisation of draft 'Guidelines in Public Sector Software'

The Director of IT for Change, Bangalore, Mr. Gurumurthy Kasinathan formally introduced the draft 'Guidelines in Public Sector Software' to be finalised while summarising the visit to the schools in Kochi.

He said that the public sector's guiding principles include social justice and equity to promote public interest over profit. To bring transparency and accountability via public participation is the motto. However, there should be demographic and economic uniformity in the deliverance of such services. These principles stand true, more so in the case of developing nations.

'Public Education' shall not just serve a public but be instrumental in creating a public through knowledge as opposed to passive consumption of content. Similarly, when it comes to software; the guiding principles of the public sector need to inform decisions of software architecture, design, integration and deployment. These principles can be fully applied through the introduction of sustainable Open Source Software models, including the adoption of Open Document formats.

The role of ICTs within governance systems, and e-governance can only be played by acknowledging the broader aspects of ICTs deployment in the public sector and their importance in development strategies of the country. Thus, Public sector computerisation projects require careful thinking on issues such as accountability to the public, security, costs of access that impact fulfilling of basic rights, equity and providing universal services which requires independence of the provider.

3.1 Plenary Session: Formal inauguration of the conference

Mr. M.A. Baby, the Honourable Minister of Education and Culture, Kerala, Mr. James Varghese, Secretary IAS, Government of Kerala, Mr. A. Parsuramen, Director of UNESCO, Ms. Cecilia Barbieri (UNESCO), Mr. Davide Storti (UNESCO-Paris chapter) and Mr. Mohammed Hanish, IAS, Director Education presided over the plenary session.

The welcome note was addressed by Mr. James Varghese after which Mr. M.A. Baby spoke about the ambition of the Government of Kerala towards total literacy of the state. ICT enabled teaching and teachers' training funded by the Government made IT@School a success that it was. Currently, the Kerala Government trains 1.5 million teachers. The Government has also encouraged the setting up of digital libraries in schools via the huge grants that it provides.

Public Software and e-Governance has brought transparency in the system of teachers' deployment. In addition, the Government has set up of in-house hardware clinics in schools and has provided electricity to each and every classroom.

Mr. Parasuram from UNESCO stressed on the milestone achievements made in Kerala. He said that the Kerala model of ICT@Schools is enabling the success of an open source software education which is the call of the day. This encourages participation of students in the learning process. In addition, they can also be part of the information society as passive consumers of digital content which becomes more accessible to them owing to the public nature of Public Software.

3.2 Public Sector Policies and Initiatives: Discussion on Government of India policy on open standards

Prakash Kumar, Director from CISCO was the panelist for the discussion. Standard policies would ensure free access to Government information or application software by people. The information in this case can be archived in the Government domain. This would ensure that there is no vendor lock-in in the delivery and service systems. Inter-operability between the developed systems by multiple agencies will be ascertained smooth transition to cloud computing. Government documents must be electronically available along with its architectural history so as to ensure its non-redundancy with new technological adaptations.

There should be a central and state repository for databases that is easily sharable and reusable. This will facilitate information accessibility via networks, promotes collaboration and is also convenient to the public. It encourages interfaces between different independent systems and would be cost efficient for the Government.

Satish Babu, CSI (Chair- SIG on FOSS) indicated that standardisation would enhance the huge potential for penetration of FOSS by enhancing the longevity of data. Contents developed after using public funds should be re-used. For this purpose, the internal Human Resource of a state must be encouraged. The democratic nature of public software should encourage the public to define changes. In addition, internet governance forums must be extensively encouraged to obtain maximum benefit of these technological adoptions.

The area of cloud computing that the Indian Government is actively looking at needs to have standard policies to govern its pathway in to Indian user base. Policies must also be developed to regulate payment gateways. Public Software should thus address the issue of accessibility to the differently abled group too.

Dr. Prem Saran, Commissioner, Government of Assam emphasised on the fact that Public Software is the medium which is only a tool. Hence, the applications must be kept simple to make it user friendly.

Dr. Amita Singh from JNU stated that standardisation is a technique of conversing with technology to minimise the information asymmetry. Therefore, instead of management information software which is autocratic in nature, policies must drive user friendly Public information software.

Legal jargons and complexities can only widen the gap in understanding and thus must be adequately addressed while designing Public Softwares. Social auditing of PS is thus also very important. Development authorities therefore play a very important role for the deliverance of services via PS.

Dr Santosh Babu, the MD of ELCOT and the Director of e-Gov, Govt of Tamil Nadu spoke about the NeGP, eForms, SSDG, SWAN, SDC and some other initiatives in the state. He said

that the state is making efforts towards the implementation of these standards to facilitate smooth functioning of the Government machinery and effective service delivery to the users. Unlettered people could avail e-Governance services via facilitators who would deliver the service at nominal charges or call centres which will transcribe the request on behalf of people in online applications.

3.3 Experiences on Free and Open Source Software in South Asia

Dr. Amita Singh, JNU spoke about the hurdles faced by developing countries in terms of infrastructural development and access to technology. Limited resource and absence of awareness is the main issue in Southeast Asia. The prevalence of lone network providers in these regions lead to lack of quality and progress. Most often, copyright issues of proprietary softwares force them to use demo softwares in ICT.

4 Free and Open Source Software in Education

4.1 Overview on ICT enabled learning and inauguration of Public Software Centre Website

Davide Storti from the Communication and Information sector of UNESCO released the ICT based website for education (http://schoolwiki.in). He spoke about the relevance and use of ICT in education. He mentioned that 90% of the government and aided schools in Kerala had access to computers and computer aided learning. This enabled them to be part of the global learning procedure via the use of internet. In addition, they could also participate in the Information Society as contributors to the various applications on Free and Open Source Software.

4.2 Teacher's demonstration of Softwares

Mr. Anvar Sadath, Director, IT@School, Kerala gave a brief introduction about the Kerala Model of Public Softwares in School. He spoke about the sweeping changes that the Government has initiated to promote its effective education via means of many teachers' training programme.

Mr. Mohammed Hanish, IAS, Director Education, Kerala spoke about the drive of the state to design ICT enabled curriculum and using ICT to facilitate the participation of teachers from across the state towards the objective of designing the content of various syllabi.

4.2.1 ICT enabled Mathematics teaching

Pradeep, a teacher under the IT@Schools project demonstrated the use of GEOGEBRA software which is a free software tool to learn geometry and its concepts. Using the software, students can effectively understand the concept of lines, intersection, triangles, angles and its various theorems. Local language fonts were extensively used.

4.2.2 ICT enabled Geography teaching

P.N. Venugopal demonstrated learning maps and the concept of eclipses using SUNCLOCK as the teaching aid. It is a highly interactive tool that enables a child to have a real life view

of the natural occurrences. The other software tools that they use for classroom teaching are Marble, KGeography, Xrmap, Kstars.

4.2.3 ICT enabled Chemistry teaching

Rajesh gave a demonstration on how ICTs such as Rasmol could that explain complex concepts of chemical bonding and structures of compounds at a micro-molecular level in a graphic manner to make it simple and understandable. Ghemical is a software that helps students to learn chemical reactions, Chemtool for two dimensional analyses of chemical structures. The digital and interactive periodic table is another tool that is extensively used. The other tools used are Kstar, Ktech lab etc.

4.2.4 Softwares for lesson planning and evaluation

This session discussed the usage of customised IT @Kerala schools initiatives in lesson planning and evaluation process. As per this process no children are failed and the minimum grade that one can get is D+, which does not demoralise the students. SCHOOLWIKI is known as the new facebook of Kerala education. It includes all the information about 1200 schools in Kerala. It also provides access to online seminars and projects by the teachers and students.

4.2.5 gknowledge, Sugar tools for education

Dr. G Nagarjuna of the Homi Bhaba Centre for Science Education demonstrated the features of Sugar desktop which is a free GNU/Linux learning environment for all cultural resources. It is simple, transparent and comprehensive. It is a creative workspace modelled on studios rather than deskspaces that encourages collaborative generation of knowledge. Based upon the logic of the handler, it teaches one the basic forms of programming in a passive way. This would enable students to self-educate themselves in art, music, language, science, mathematics, communication practices etc. He urged the delegates to use the term digital resources instead of content, since the latter suggests a passive learner.

5 Conclusion

Education is a public good that the state government provides to its citizens. Right to education is now a fundamental right and every student must have equal access to it to retain the fervour of democracy. ICT has been identified as a major driver that can facilitate this process. However, it is essential that the platforms are free from licensing and the architecture of the software that enables it is participative. For this to be achieved to its fullest potential, the Government must draw certain guidelines or principles in the policy that mandate its development and use.

This led to the drafting of the Kochi declaration that states that Public Software is used for serving the public interest, developed or procured through public funding, and publicly owned, permitting its free sharing, modification and distribution and thus has objectives of ensuring equity and social justice, has implications for ensuring universal access to such software, enabling transparency and participation by the citizens in its design and use.

To realise these objectives, Public Software needs to be freely shareable amongst all members of society, is permit to public overview, participation and audit. It must use open standards that ensure interoperability and portability across multiple media. National and

state repositories for Public Software resources be established at national and sub-national levels, that support re-use of applications. Digital learning materials should not be procured on a royalty basis and any exception will need to be justified. Public ownership can be ensured via source code ownership which is real and not nominal providing the concerned public agency with full ability to share and modify the software as required in perpetuity. This can be achieved by building capacity of functionaries, stakeholder participation in design and development, componentisation of the development process, as well as required user and program documentation that should meet the test of public sector imperatives.

6. Annexure A- List of Participants

Mr Mohamad Adly	Educational development centre (EDC) , ma. vavathi, nikagas hingun, male' , republic of Maldives
Mr. Mohammad Adeel/Aleem	CENTRE FOR CONTINUING EDUCATION, MINISTRY OF EDUCATION, MALE', MALDIVES
Dr Aamal Ali	Ministry of Education
Mr Tenzin Dhendup	
Mr Prakash Raj Pandey	
Mr. Md Mofakkarul Islam	System Analyst, Ministry Of Education
Mr Abu Taher Khan	Programmer, BANBEIS, Ministry of Education
Mr Kiran S Chandra	Swecha
Mr. G M Niel Gunadasa	Director of ICT Education
Dr Nagarjuna	G Knowledge
Prof. Lata Pillai,	IGNOU,Delhi, India
Shri. Rajshekaran	Greenstone,
Shri Amit Chakravarty	NISG
Shri.Prakash Kumar	CISCO
Shri Vikas Kanungo	Society for promotion of e-governance
Shri. Ajay Kumar	Secretary ,IT
Shri Prakash Deo	M.P ,SCERT
Shri. Hasmukh Adhia	Education
Dr. Amita Singh	Centre for the Study of Law and Governance, Jawaharlal Nehru University, N. Delhi
Gurumurthy	IT for Change, Bangalore

Kasinathan	
Smt Shashikala CB	(SSA)
Sri TP Bapuji	(Commissioner's office)
Dr Nagambika Devi	(Higher education)
Mr. Naimur Rahman	OneWorld South Asia
Shri.Venkatesh Hariharan	Knowledge Commons
Dr. Prem Saran	Information Technology
Shri. Gopalakrishnan Devanathan	Life line to Business
Gautam Choudhury	Scientist-D' NIC, Ministry of Communication
Shri.D S K Rao	Director
Smt. Jayalaksmi Chittoor	
Shri K . Subramaniam	
Shri. K. VijayaKumar	Commissioner of Income Tax
Shri. Jitendra Shah	
Mr. Gurumurthy Kasinathan	ITFC
Smt Swathi Joshi	Yaswantaro Chavan Academy of Development Administration
Shri Santhosh Babu	MD , elcot
Pranesh Prakash	CIS
Shri Ravindra Babu	INTEL
Dr Piush Antony	UNICEF
Ms. Aarti Saihjee	UNICEF
Shri Md. Ali Rafath	SSA
Mr Rahul Chopra	LFY magazine
Mr. Anil Khainthola	Good governance Magazine

7 Annexure C- Some discussion on the draft

1. With reference to the definition of term Software in Public Sector, it was recommended that the term be changed to Public Software which defines its role more precisely.
2. (2.1.1) It was suggested that the government be not misunderstood as the public sector. Instead, the sentence could be rephrased as:

   "Public Software developed to promote public good-that helps the government including public sector units to fulfil the goals of the Government- software that supports NREGA transactions in a transparent manner."
3. There was also a reference to the fundamental need to regroup systemic knowledge to build on individual strengths in terms of policies pertaining to Public Software.
4. (2) There was a dispute with the term academic institutions and civil society (NGO/CBO): The suggestion was to rename the organisations as 'for profit or non-profit'.
5. (5.1) It has a syntax error of 'provide provide' in its last sentence.
6. (7.4) There was a suggestion to change the sentence as follows:

'There is very little database on Public softwares....'. It was also deliberated that there needs to be a wider definition of cross learning mechanism that is limited.

There was also a suggestion to include point 7.9 that defines Software as a public service (SAS) that needs to be maintained.

7. (13) There is a need for the Government, both at the Centre and the State to build a repository of applications on public software and otherwise to minimise costs. Point 13 lacks a reference without such a policy in place and if the repositories are mandated then point 13 stands redundant.
8. (19) Refer the second sentence: 'In case of software applications (which in a sense implements government policy), too, such public processes are required to ensure that the requirements of the community are also catered to in design'- The idea was touted as to be utopian considering that it is practically not possible to create such designs as the process would be quite cumbersome.
9. (20) Grammatical error in the first sentence. Should address the issues of ownership and accessibility.
10. (21)*something about using less power*
11. (26) Software development process: To build up a consortium and make the development process transferable, upgradable and deployable.
12. (27) There has to be a mechanism in place for public funded documentation of the architectural process of building softwares and applications on FOSS where the history of the process is also documented.

13. There needs to be a third party certification process that is public funded (infrastructural resources and application framework) that might help to know the specific requirements of the public and build a participative process of contribution.

14. (33) Education: The definition of education needs to be first and foremost deliberated on and it needs to be bifurcated into two sections: the administrative side and the teaching-learning process side (pedagogy).

8 Annexure D- Media Coverage

The Hindu:
May 26: http://www.hindu.com/2010/05/26/stories/2010052650480200.htm
May 29: http://www.hindu.com/2010/05/29/stories/2010052960590600.htm

The Indian Express:
May 26: http://expressbuzz.com/cities/kochi/conference-on-public-sector-software/176518.html
May 27: http://expressbuzz.com/cities/kochi/a-peek-into-the-secrets-of-success/176612.html

Kerala IT News Portal:
May 25: http://keralaitnews.com/other-it-news/foss/1080-kochi-to-host-international-conference-on-public-software

Kaumudi Online:
May 26: http://www.kaumudi.com/news/052610/kerala.stm#2