Telecentre Technology
The application of free and open source software

Photo: Bangladesh-Connect

This APDIP e-Note is the third in a sub-series of accompanying APDIP e-Notes, dealing with telecentres. It focuses on FOSS applications in telecentres. The first APDIP e-Note (no. 14) presents telecentres as a mature development mechanism and the second APDIP e-Note (no. 15) examines models for financing telecentres to ensure sustainability.

Summary

Telecentre models are successful when the focus, starting from the early planning stage, is on its sustainability. Two critical factors affecting the sustainable operations of any telecentre are: (i) its information and communications technology (ICT) infrastructure; and (ii) the choice of hardware and software.

Of course, the sustainability of the telecentre is also dependent on many other equally important factors including service delivery, staff responsiveness and community acceptance, especially of new technologies. This APDIP e-Note, however, will focus on the technological aspects.

The choice of hardware and software should not be based on what others are using, but rather on what is needed and appropriate to the telecentre and the community it serves in the long run. Recent findings from various experiences, some of which are mentioned in this APDIP e-Note, show that free and open source software (FOSS) applications combined with low-cost hardware have emerged as an intelligent solution for sustainable telecentres.

This APDIP e-Note explores the benefits of using FOSS applications in telecentres with case studies from Bangladesh, India, Pakistan, Brazil, Egypt and Sub-Saharan Africa. The affordability of FOSS and its openness to modification and localization is contributing to the sustainability of telecentres, and more broadly, to empowered communities and poverty reduction.

What is a telecentre?

A telecentre is a public place where people can access computers, the Internet and other technologies that help them gather information and communicate with others at the same time as they develop ICT skills. While each telecentre is different, the common focus is on the use of technologies to support social and economic development, such as reducing isolation, bridging the digital divide, promoting health education, creating job opportunities and reaching out to youths. Telecentres exist in almost every developing country, although they sometimes go by different names (e.g. village knowledge centres, infocentres, community technology centres, community multimedia centres or school-based telecentres).[1]

What are the ICT services provided by telecentres?

Telecentres may be set up to provide various ICT services including telephone, fax, photocopying, computer use and basic Internet access. Telecentres may supplement education and vocational training, health-related services (e.g. telemedicine), e-commerce-related services (e.g. provision of agri-market rates), and e-government services (e.g. information on and application for government loans).

Telecentres may be stand-alone buildings with information kiosks and Internet stations. Or schools may use their computer labs as telecentres after school hours, commonly termed as school-based telecentres.

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[1] This is a generic definition derived from Wikipedia. http://en.wikipedia.org/wiki/Telecenter

What is FOSS?

Software is a program or set of instructions that controls the operation of a computer and distinguishes it from the actual hardware of the computer. Software is required to run the computer hardware. Today there are various forms of software that differ from each other in the way or through the process that they are developed, distributed, modified and licensed. The most prominent types of software in use are: (i) proprietary software; (ii) FOSS; and (iii) a combination of the two.

Most proprietary software licenses impose various forms of restrictions on usage. These restrictive licenses carry high per computer or per user costs. An alternative has emerged in the form of FOSS.

FOSS is software that can be used, copied, studied, modified and redistributed without restriction.[2] These freedoms that are for all – developers and users – are highly significant to the developing world as FOSS increases access, ownership and control of the ICTs. It provides a framework for the usage and sharing of intellectual capital in a way that is applicable to many areas of development. The adoption of FOSS presents opportunities for capacity development, localization and customization for diverse cultural development needs.

To date, there are a wide range of relevant and useful FOSS applications, and a huge community comprised of developers, companies and FOSS users, are supporting different FOSS applications and continuously improving on them. The well-known GNU/Linux operating system is an example of FOSS. Other examples include the OpenOffice.org productivity suite and the Firefox web browser.

Why use FOSS in telecentres?

Widespread use and proven results: FOSS applications have been used by many different organizations in rural communities, academia, governments, civil society, and small and medium enterprise, throughout the world. A wide variety of FOSS applications are available for creative arts, office productivity, business management, website management, databases, education and many more.

FOSS is widely available for download through the Internet as well as offline mediums, such as CDs, where connectivity is scarce. Since FOSS has been widely localized into many local and regional languages, it catalyzes widespread digital access, reducing the digital divide between rural and urban regions, enabling poverty reduction, and promoting education, vocational skills, and access to agricultural and business information.

Reduced costs and easy access: In terms of costs, FOSS is available almost free of charge and when coupled with low-cost or refurbished hardware, proves to be highly cost-effective for telecentres. Most FOSS applications and technology platforms, including various Linux operating system distributions such as Ubuntu,

Fedora and OpenSuSE, carry office productivity applications, Internet browsers and email clients, Internet messaging and voice over Internet protocol tools, bundled together into a single installable system with graphical user interfaces that can be installed and used by telecentre staff and community users with little IT knowledge and skills.

Low-cost computer networking models: Telecentres can benefit from the Linux Terminal Server Project[3] (LTSP) innovation in FOSS that provides the opportunity for multiple users to access a single server hardware machine through thin client terminals, also known as dumb terminals. The LTSP package is available with almost all the latest Linux distributions. LTSP enables users to use the same single computer hardware machine simultaneously while software applications run on the server with a terminal known as a thin client handling commands. Computers that have the LTSP package installed are usually low-powered and have no hard disks installed. LTSP is widely used by telecentres and schools around the world providing the opportunity for multiple students to use computers without the need for purchasing high-cost and high-performance machines.

Round the clock online technical support: Most Linux distributions come with online community support through websites, discussion forums, chat channels and mailing lists, providing the opportunity to seek assistance from and network with a very large global community 24/7. FOSS websites are well equipped with online documentation and reference books available in various languages providing the opportunity to gain FOSS skills through self-study.

Extending outreach: Telecentre movements, such as the ADEN project in Sub-Saharan Africa (see example below), have developed various telecentre software solutions using FOSS development tools and made them available for widespread use by other telecentres that are embracing the benefits of FOSS for their sustainability. These solutions can be customized and localized according to local and regional requirements.

Examples of FOSS use in telecentres

Bangladesh

The Bangladesh-Connect[4] initiative has deployed Ubuntu Linux in ten Gonobidyalaya[5] schools and provided teacher training on FOSS applications. These Gonobidyalaya schools have established Internet Learning Centres (ILCs) that run FOSS on computer hardware. Teachers and telecentre administrators have recently been trained on the use of Linux, OpenOffice, GIMP and related programs. Trained teachers can now create word processing documents, presentations and web pages using FOSS.

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[2] http://www.gnu.org/philosophy/free-sw.html

[3] http://en.wikipedia.org/wiki/Linux_Terminal_Server_Project
[4] http://www.connect-bangladesh.org
[5] Gonobidyalaya is a non-residential school that aims to impart skills development training and basic needs-oriented non-formal education. http://www.school4life.org

India

The Goa Schools Computer Project (GSCP) was launched in Goa to provide affordable computers to rural schools, for use by students, teachers and the surrounding community members. FOSS applications are used to reduce costs. The Goa Department of Education, Red Hat Linux, Goa Sudharop Community Development Charity and other non-governmental organizations (NGOs) all contributed to making this project a success. Using recycled computers and the FOSS GNU/Linux system, a total of 125 schools received computers that otherwise would not have been available to them. To date, the Government of Goa has contributed about 750 computers to 350 secondary schools enabling every school to have at least one computer. The project has also provided 100 schools with 450 recycled computers reducing the PC-to-student ratio to 1:60. Before distribution to schools, GSCP tested and refurbished the equipment, and later provided training to teachers in the use of the Linux operating system.

Pakistan

Telecenters and Community Resource and Information Centers in Pakistan[6] is a 279-page document that provides strategic directions for Pakistan's telecentre movement. This document carries a detailed FOSS case study and guide. It includes business models with sample calculations that look at the costs of different software – FOSS and proprietary. They are aided by charts of revenues and purchase costs, costs and selling prices of services, and operating costs. The study informs that the correct combination of hardware and software can cut capital costs by 60 percent.

Brazil

Initiated in 2001 by the Secretariat of Participation and Partnership, in the east zone of the Capital of Tiradentes City, the Telecentros Project of Sao Paulo[7] brings ICT access to the city's poor communities through telecentres equipped with donated hardware computers running Linux and other FOSS applications. The Telecentros Project was initiated to promote the use of computers by the citizens of the region. Each telecentre has been equipped with an average of 20 networked computers connected to the Internet. The telecentres offered various basic computer literacy courses, including the use of FOSS office productivity software. The Secretariat of Participation and Partnership aims to set up 300 telecentres for the city of Sao Paulo in order to promote inclusion and generate jobs that improve livelihoods. The project claims to be the largest FOSS-based telecentre project in the world.

Brazilian youths are drawn to the telecentres by the wide range of FOSS music applications, enabling them to create new bands and promote their music online. These youths are frequently from disadvantaged homes and the telecentres provide opportunities for breaking the poverty cycle.

Egypt

Since January 2005, ArabDev[8] in collaboration with the Menia Education Department has been delivering FOSS skills training to teachers in two Adadeya schools (Salah el Din and Adib Wahba) of Menia's Abu Qorkas district. These teachers in turn train community members, provide computer and Internet use for a nominal fee to students and the community, and promote the replication of the project to other schools. The telecentres offer dual-boot[9] systems and FOSS training courses. Localized graphical user interfaces in Arabic are also used at the telecentres.

Sub-Saharan Africa

The Fostering Digital Inclusion (ADEN) Project[10] is an international cooperation project designed by the French Ministry of Foreign Affairs. It is being implemented in 13 countries of sub-Saharan English, French and Portuguese-speaking countries from 2003-2008 with a budget of EUR 6 million. The goals of the ADEN project are to increase democratic access to the Internet; supply training in use of new technologies; and encourage an African production of content.

The project aims to establish 60 Internet public access centres in landlocked areas in rural and urban zones affected by lack of connectivity or unsuitable connectivity that is overly expensive or of poor quality. The centres are managed by members of civil society association, NGOs, university outposts, churches, local authorities and radio stations. As of 18 June 2007, 42 ADEN centres are operating in 11 countries including Angola, Burkina Faso, Burundi, Cameroon, Guinea, Mali, Mozambique, Nigeria, Central African Republic, Democratic Republic of the Congo, Senegal and Tanzania.

The ADEN centres are equipped with a customized centre management solution developed jointly with a French FOSS development firm, Mandriva. The solution is available as an 'ADEN Pack' localized into English, French and Portuguese, and it can be translated into other languages. The ADEN Pack helps in automating procedures that make the job of telecentre managers easier.

Conclusion

Software enables us to connect and communicate in ways that drastically changes how we work and play. For telecentres in developing countries, the adoption of software solutions, and ICT in general, as an enabler for social and economic development is severely limited by financial constraints.

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[6] http://ifossf.org/ifossf_library/foss_in_telecenter_resources
[7] http://www.telecentros.sp.gov.br

[8] http://www.arabdev.org/about/stories
[9] Dual-booting is the act of installing multiple operating systems on a computer, and being able to choose which one to boot when switching on the computer.
http://en.wikipedia.org/wiki/Dual-boot
[10] http://www.africaden.net/spip.php?article30
http://www.africaden.net/article.php3?id_article=241
http://community.telecentre.org/en-tc/node/22920

FOSS is an internationally accepted and viable solution due to its low and effective cost models, ability to employ local talent relying less on foreign expertise, and availability of various localized distributions. FOSS represents an alternative choice to prohibitive license fees and piracy, as well as an opportunity to participate in the creation of the country's own information age and online society.

There are a growing number of examples from around the globe where FOSS has been used for telecentre sustainability and can run on re-furbished low-cost computer hardware. FOSS has been particularly useful for developing countries in empowering communities and helping to bring about social and economic development.

~ Fouad Riaz Bajwa, International Free and Open Source Software Foundation

Additional Reading

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