

Master Plan for Implementation of Free and Open Source Software in Cambodia

Introduction

This Master Plan is the materialization of a strong belief – within the Cambodian Government – of the fact that Free and Open Source Software (Open Source) can help reduce the digital divide in our country, producing the qualitative push that will drive our society out of the list of countries that are unable to effectively use technology.

Among the advantages of Open Source we consider two very directly affect Cambodia: being able to translate Open Source applications to the Khmer language and having no licensing costs.

Language is – without any doubt – the strongest barrier to ICT adoption in all countries. Experience shows that efficient use of technology in all layers of society only takes place when using software in the local language. Translation of Open Source Software to the Khmer language opens the way to this fundamental step, while at the same time strongly reduces the necessary training time for user and allows taking computer training into government offices, schools and rural areas. Local language software is also a strong asset in the defense and modernization of the Khmer language, so that Cambodia can move into the world of technology without having to forfeit its culture. Having control of the ability to localize operating systems and applications is a key advantage of Open Source over proprietary software, which requires individual arrangements and licenses with each software provider, --generally both time-consuming and costly.

Cost is also a key issue for the country and for its citizens. Basic proprietary software for each computer costs in excess of twice the annual average per capita income in our country, making legal use of proprietary software off-limits for most Cambodians. It is also a great financial burden for the Government, especially at a time in which computerization of most Government offices is considered in the coming years.

This Master Plan is an instrument to implement the ICT policy defined by the Government, in the belief that Open Source is the most direct and safe way of reaching many of our social and technical objectives, as well as gaining technological independence and minimizing dependency from foreign corporations.

This is an implementation plan. Technical steps - such as translation of software or the creation of support structures - are considered within a framework that looks forward to our social goals, including all the necessary actions that will be required in the next four years to fulfill these aims.

Present situation in Cambodia

The use of computers in Cambodia has been growing exponentially throughout the last decade. As there are no computers that work in Khmer script, Cambodians use computers with desktops and applications in foreign languages – mostly English. It is possible to type Khmer texts with a word processor, but in order to do so the user needs to first learn some English.

These problems come at a time in which the Khmer linguistic heritage has been weakened. Students have little formal knowledge of the language, and important issues such as the number of letters, the alphabetic order of words in Khmer, recommended spellings, or general linguistic rules are still unclarified and open to differing interpretations. . Entering into a foreign computer world that does not assist fixation of Khmer language issues creates further confusion (while bringing into the language foreign terminology).

As sufficient support for Khmer script does not exist, no databases that use Khmer language can be developed for governmental use, complicating enormously the work of the Government (as well as and private companies), who desperately need databases of citizens, customers, etc. The transcription of Khmer script to roman letters leads to ambiguity, making the use of transcribed characters very unreliable, as well as forcing alphabetic sorting to follow English language rules, instead of supporting traditional Khmer sorting.

A medium level of English is now a pre-requisite for computer training in Cambodia. This requirement makes training very long for those who have not learned the English language before: the poor, people in the provinces, the young in schools and many government officials (with corresponding difficulty for computerizing the Government). Lack of English skills becomes a de-facto barrier for many jobs that do not intrinsically require the use of the English language (such as doing accounting, correspondence, invoicing or stock tracking for small businesses).

Almost 100% of the software used in Cambodian end-user computers is proprietary. Not having an Intellectual Property law in the past, the use of this software in Cambodia was not illegal, but the entry into WTO has forced Cambodia to develop such law, making it now illegal, and forcing the country to look for other solutions to its technological future.

Objectives of the Open Source Implementation Master Plan

This Master Plan is a direct response to specific social needs of Cambodian society. Even if the response to these needs is technological (many of these goals are directly attained through Open Source Software localisation to Khmer language and culture), it is important to always keep in mind that the aims themselves are social, directed to improving the quality of life of Cambodians by:

- Reducing the Digital Divide through empowerment of the least advantaged, giving them access to jobs that require the use of computers. Reduction of training time and cost for jobs that require computer skills (but not English). Effective separation of the “English” and “Computer” skills.
- Permitting training on technology from early stages in the education system (using software in Khmer language). Permitting reaching out to rural areas in order to offer to them training on skills similar to those which might be offered in large cities.
- Facilitating technology-based communication (e-mail, SMS, chat, web) in Khmer language.
- Protecting the local language from an excessive entry of foreign terms that complicate training and integration in the work place. Clarification and standardization of the correct use of the Khmer language and of Khmer cultural issues such as alphabetical sorting.
- Facilitating the computerization of the Government through the use of Khmer language. Improving governance by supporting the Government in the creation and maintenance of databases in Khmer script. Centralizing developments for different Governments, reducing development costs.
- Promoting the use of information technology in Cambodia, giving citizens much easier access to information and resources.
- Drastically cutting software costs for final users and for the Government, while promoting the use of legal software and reducing illegal software piracy activities in the country. Decreasing payments to and dependency from foreign proprietary software manufacturers. Decreasing Government costs by assuring that software specifically developed for a given government (such as a provincial government) is reusable in similar administrations and available as Open Source.
- Creating the necessary expertise for the country to be technologically autonomous on software development, while opening the door to the strengthening of a Cambodian software development industry and to the participation of universities on the construction of this new framework for ICT in the country.
- Becoming a Regional Center for Open Source Localization Expertise that will help other countries plan and execute effective localization projects.

Applicable Policy

This Open Source Implementation Master Plan does not create policy; it is designed as a tool for implementing some of the most important points of the Cambodian Government’s ICT policy [insert reference to source]. In particular, the following selected points are considered:

“The country will build up its policies on information and communication technologies to directly or indirectly address human development and poverty alleviation in particular.”

“The Government will embrace and integrate ICT as an integral and active part of its socio-economic development strategy.”

“The Government will ensure that national heritages; culture; traditions and the environment are adequately safeguarded in its pursuit to ICT development.”

“The Government shall promote the use of ICT in both public and private sectors to encourage transparency competitiveness and overall efficiency of their functions and procedures.”

“The Government will support the use of ICT for formal and non-formal education, skills development and adult learning regardless of age, gender, ethnicity, disability or location.”

“The Government shall mandate the Ministry of Education Youth and Sports to provide all teachers in public and private schools the basic ICT training. The Government shall allocate or mobilize additional resources and facilities to meet this objective.”

“The Government shall encourage and support ICT knowledge for all public servants.”

“**The Government will promote the use of Open Source** systems in ICT to cut costs in the long term, but also to broaden the skills and capacities of ICT professionals.”

“The Government will take appropriate measures to ensure ICT will be used in all sectors for efficiency, privacy, security, safety and reliability based on **international interoperable standards**, for the purpose of rebuilding the country.”

“The Government will actively seek the participation of civil society entities such as NGOs and NPOs in national capacity building in ICT.”

“The mandate to the National Information Communications Technology Development Authority (NiDA) as a promoter and regulator of ICT services in the country will be re-enforced. Government encourages all agencies to engage NiDA actively in their respective agencies ICT plans.”

Strategy

The Master Plan is based on the following strategic considerations:

- The Master Plan will be coordinated and directed by NiDA, but it will implicate all ministries of the central Government, and will also try to reach provincial and district Governments. Special attention will be given to close coordination with the Ministry of Education Youth and Sport and the Ministry of Labor and Vocational Training.
- NiDA will work together with civil society, turning the plan into a multi-stakeholder action that will involve the private ICT and ICT-training sectors as well as NGOs. It will try to adapt to the current private ICT distribution channels and work with them to assure that the Plan reaches all the layers of Cambodian society that it possibly can.
- NiDA will work to reduce the barriers to the acceptance of Open Source Software, through active campaigns and through training. It will try to homogenize training, giving students clear goals to reach and employers clear criteria for what to expect from trained students.
- NiDA will assure the creation of Open Source expertise in all stakeholders involved in the process, as well as in all user groups, such as bodies of the Government, universities, private software development sector and specific civil society players.

Actions of the Master Plan

1.- NiDA will create a specific unit for Open Source that will be in charge of assuring, promoting and coordinating:

- Open Source localization efforts leading to end-user software in Khmer language.
- Capacity building for final Open Source users (users of software in Khmer language) in both civil society and Government.
- Capacity building on Open Source professionals.
- Distribution and lowering of barriers to the use of Open Source.
- Agreements with partners in Government and civil society to assure that as many computers as possible in Cambodia are prepared to work with Khmer Open Source programs.
- The use of Open Standards all through the Government and assure that applications developed for one administration can be used by others.
- The development of purchasing policies for the Government that will require considering Open Source in all software purchases, and justification of the purchase of proprietary software, explaining why it is necessary if similar Open Source Software is available.
- Advocacy on the use of Open Source nationally and internationally.

2.- NiDA will develop a detailed action plan that will:

- Assure that – directly or through civil society partners - high-quality basic Open Source applications mostly used by users are localized to Khmer language (office applications, Internet tools, multimedia, etc.). Documentation for these applications in Khmer language will also be developed.
- Assure that a complete Open Source operating system and all basic applications (a distribution) will be available fully in Khmer language, together with its documentation.
- Develop training materials for all these applications, together with evaluation materials. Develop a student certification program that will permit assuring levels of knowledge to organizations that will later employ the students. Provide training to present computer trainers and develop the certification program through partnership with existing end-user computer training institutions.
- Develop a distribution plan that will involve computer vendors, software vendors, NGOs and direct action by NiDA; the clear goal will be to assure that most new computers have all the Open Source applications pre-installed, and that most old computers in local Governments, NGOs, SMEs, libraries and Internet cafes are prepared to use applications in Khmer.
- Provide ICT training to Government officials and promote the use of e-mail in Khmer language all through the Government, facilitating inter-ministry communications.
- Work with the Ministry of Education Youth and Sports to train teachers on the use of Khmer language Open Source applications and to coordinate the deployment in schools

of computers equipped with Khmer language Open Source programs. Reinforce the present educational system with e-learning training materials in Khmer. Work with the Ministry of Labor and Vocational Training to prepare ICT related curriculums and learning tools.

- Create – in collaboration with universities and civil society – a Free and Open Source Research and Support Center (FOSRSC) that will provide Open Source and Khmer script management expertise to Government, universities and the ICT industry while providing second level support for the development of Open Source based applications for Government and Industry. The FOSRSC will also provide support to final-user through a service network. It will also interact with the international Open Source community to assure that the different projects are well internationalized and prepared to be localized to the Khmer language. It will also take care of upstream integration of Khmer localization into the Open Source projects.
- Assure - either directly in NiDA or through the FOSRSC – that databases developed for the Government use Open Standards, so that the format does not make the Government dependent on a specific software vendor. As database development efforts will start from the beginning, define a specific standard for all Governments (based on Open Standards) that will later enormously facilitate the exchange of data between local governments.
- Try to assure that applications developed for different Governments have Open Source status, so that it can be used by similar administrations all over the country. Assure coordination of governments so that knowledge about available applications is accessible.

3.- The action plan will span four years, divided in four one-year stages, each of them having very clear goals and deliverables:

Stage 1

- Localization of multi-platform Open Source office and internet applications (applications that run on both Linux and MS Windows).
- Development of documentation and training materials.
- Setup of training certification system.
- Setup of Open Source structure in NiDA.
- Specification of needs and goals of a Free and Open Source Research and Support Center . Creation of a network with universities and private ICT industry.
- Development of a Khmer-Khmer computer dictionary.
- Assure that support for Khmer script is available for all internationalized applications on Linux.

Stage 2

- Installation campaign (initially on MS Windows platform) for applications developed in the first stage. Reach out to all public computers in the country, including training

centers, cybercafés, libraries, NGOs and anybody who requests it. Agreement with computer vendors for pre-installation in new computers.

- Launching the certification program. Training existing computer teachers so that they can change to teach Khmer language Open Source applications. Certification of such teachers within the certification program. Reach out to training centers and certification of training centers.
- Collaborative work with the Ministry of Education Youth and Sports for the training of teachers and starting pilot sites in schools around the country. Collaboration also with the Ministry of Labor and Vocational Training for the creation of ICT curriculums, training materials and training of trainers.
- Training of public servants to the use of Khmer language Open Source applications is organized by NiDA in all ministries and local governments
- Development of a full Linux distribution in Khmer language, with all necessary applications.
- Creation of the Free and Open Source Research and Support Center. Intensive in-house and off-country training. Active participation in the various regional and international Open Source projects directed to assuring that the applications are well prepared for their use with Indic scripts (such as Khmer, Thai or Indian languages), participating in quality assurance procedures for those projects. Consolidation and write-up of localization expertise for sharing with other countries. Participation in international project-specific or localization meetings.
- Development of local Open Standards, based on international Open Standards, for data exchange and encoding within the government. Analysis of computer needs of local governments, coordination of possible collaborative developments based on Open Source.
- Development of software purchasing policies for the government requiring consideration of Open Source options.

Stage 3

- Installation campaign for the full Linux distribution in Khmer language, using the same applications that were used on Windows before, so only operating system and side applications change. Work with vendors to try to have them offer dual installations in new systems.
- Retraining of computer teachers to install, use and teach the chosen Khmer language Linux desktop.
- Developing further the certification program for the inclusion of the use of full Linux-based Khmer systems. Correction of faults detected after one year of experience.
- Start migration of Government computers to Linux.
- The Free and Open Source Research and Support Center will start training technical personnel in the different ministries and other bodies of the government that require local support, as well as stepping up training of University professors and students, as well as analysts and programmers for private industry. A section for support for final-users is developed.

- Cambodia-specific Open Standards will be made mandatory for all applications developed for the Governments, assuring easy exchange of data, simplification of procedures and clear savings of development costs.
- Development of two new versions of the Linux-based Khmer distribution, keeping pace with international upgrades, adapting it to user demands and including new applications that might be considered necessary.
- Implantation of Open Source aware purchase policies.

Stage 4

- Consolidation of the use of Open Source by final users and Government in Cambodia.
- Complete migration of Government computers to Linux
- Evaluation of impact of Certification Program, introduction of corrections for maximization of impact.
- Follow up on use of Open Standards, establishing control criteria.
- Establishment of sustainability procedures for the Free and Open Source Research and Support Center.

These stages – and specially the last two – might be adjusted and modified as the overall Action Plan advances.

Expected results

By the end of the second stage, the Government expects:

- To have converted 80% of its computers to use Khmer language Open Source applications for office and communications, with their users trained to use these tools. Most servers will also be running Open Source Software by that time.
- To have Open Source applications pre-installed in 80% to 90% of new computers sold inside the country, and that most of old non-obsolete equipments will also be running the applications.
- Between 200 and 300 experienced computer teachers from private training industry will be prepared to teach the use of Khmer language Open Source applications, and will be certified to issue certifications to students. Over 50 training centers will have become partners of the project. At least 50% of the end-user computer training will be in Khmer language, based on Open Source applications.
- To have the FOSRSC up and running, having accumulated –through training- sufficient experience to start offering technical training to universities, governments and private industry, either for teaching or for Open Source first level support.
- To have specified the Open Standards that will be used by the government for the development of applications and databases.

By the end of the fourth stage, the Government expects:

- To have most Government offices turned completely to Open Source, for office and communication use as well as for specific applications and databases. Proprietary software will only be used for limited, specialised needs for which no Open Source Software of reasonable quality is available.
- To have most users in the country use Open Source applications for office and communication purposes, as well as for SME management.
- To strongly reduce the level of software piracy, reaching levels comparable to Western countries, in spite of the economic differences.
- To have in the country a established software industry that serves the Government, as well as private customers, using Open Source for most of its work, making the country independent from foreign software manufacturers and expensive foreign software development companies.
- To have in Cambodian Universities a constant provider of ICT professionals well versed on work with Open Source Software tools, assuring the human resources needs of Government and private industry.
- To have in place a framework for the sustainable maintenance and upgrade of Open Source, supported by Government and/or civil society.

