

Bridging Digital Divide by Empowering School in Rural Area:  
Case Study in Kebumen Region, Central Java, Indonesia

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**Abstract**

Information and Communication Technology (ICT) is one of the factors to enforce nation economic growth. Utilization of ICT can become catalyst to solve many nation problems in many different aspects. The world is changing and to get success in facing it, government, private sector, community and educators have to work together. In a single individual aspect, the ability to use ICT is one step toward success to face the changing world. Well known ICT Community is the nation basic need in order to be able to innovate and compete in global community.

Indonesia has many lacks in ICT which are needed to solve immediately, such as gap in technology access in rural and urban areas. Only limited peoples in rural areas can access to the internet, the one work for local government. ICT infrastructures are very limited, expensive and not even spread out. On the other hand, fortunately some of schools at rural area are already equipped with personal computer.

Empowering the role of schools and partnerships with local government and local private sector is one way to bridge digital divide and increasing the local community ICT literacy and finally improve their prosperity.

The objective of the activities is to increase opportunity the rural community to access global information easier and cheaper, hence rural economics can grow and job vacancies are more open. To achieve this objective, the following proposed steps have to do (1) study of economics aspect for telecenter sustainability (2) study of the best practice and the best application for telecenter

(3) collaboration establishment with local government and private sectors (3) to educate the community (4) monitoring.

This paper discusses our activities in disseminating the idea of telecenter and our effort to increase ICT literacy which was held in Kebumen, Central Java, Indonesia on August 2006. The activities involved the local government, private sector, and some schools with around 160 participants from different backgrounds.

## **BACKGROUND**

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Information and Communication Technology (ICT) has change people live style. ICT also already approved to increase productivity in many areas. ICT has very important role in increasing economic matters in a community.

There is evidence that is very large ICT Skills gap in Indonesia community caused by socio-economic, demography, and geography factors. In term of geography, Indonesia has 17,508 islands, and more than 240 millions peoples. Around 16.6% (2005) or 62 million peoples from the population are below poverty line. The population are not distributing equally and people in Indonesia tend to go to a big city such as Jakarta, Surabaya, and Medan. This is caused by lack of job vacancy in their original village. This is also caused by different economics growth in urban and rural area. While economic growth in urban area is very fast, but it is grow very slow in rural area. Base on this reason, the business sectors are focus to their investment in urban area; including their investment on ICT infrastructure. Different opportunities to access information via ICT at urban and rural area cause the digital divide larger and larger. While many peoples in urban area are already used ICT for many activities, other peoples in the rural area are not familiar with computer. Indonesia needs to accelerate opportunity for the community to access the information through supplying both hardware and software especially for rural area and east of Indonesia.

### **Rational**

As mention above, the digital divide in Indonesia is mostly caused by socio-economic, demography, and geography factors. Access to information and communication through internet is still limited, whereas only for small community who stayed in urban area and closed to centre of government, centre of business or university. The peoples in rural area and others areas that

are far away from the centre of government, centre of business or university almost have no opportunity to take advantage for using ICT. It is caused by lack of ICT infrastructure and the problem in the human resources it selves. On the other hand, fortunately some of junior high school and senior high school, which widely spread almost in every region, was already equipped with computer. But, unfortunately the computers are commonly still stand alone and have no access to internet, hence it is become underutilized. Empowering these resources by integrating them as Local Area Network and connecting them to the internet will improve their functionality. These infrastructures are to become centre of information for community around the school. The economic aspect must be considered for sustainability.

Another problem related to utilization of ICT in rural area is the level of awareness and level of skills from the community it selves which still relatively low. While many peoples already used ICT for many activities, a computer for part of rural community still becomes strange thing. Hence, the empowering of the community it selves by increasing their ability to utilize ICT also must be considered.

### **This is the Idea**

In our point of view, there are two important aspects caused the digital divide in Indonesia, they are the infrastructures and the human resources. It will very costly if lack of infrastructure must be overcome with supplying new infrastructure from zero. It will be efficient if the existing of the infrastructure can be optimized and utilized by empowering and integrating the system to have connection to the internet.

At this time, some schools have already equipped by computers, but the existing computers are generally still under utilization and not become a centre of information for the community. The improvement in community awareness to the ICT, alarity from the school to share their infrastructures, and supporting regulation from the government can decrease the digital divide. The school not only will give advantages to the community but also can take advantages from their infrastructures. For sustainability, the school will directly obtain the advantages in term of skill to manage a telecenter and financial advantages to cover operational requirements. The schools also get advantages from the development of the telecenter in term of giving opportunity to their students to access global information.

Human resources are also very important. Whatever good conditions of infrastructure are, if human resource can not utilize them, it will be useless. Communities in rural area are commonly unfamiliar with ICT. It is need to indeed effort to revive them about the advantage of ICT for their lives. We need to intensive socialization using all media to deliver the idea. Cultural approach by involvement of the community leader is one important media. The awareness must be followed with serious education so they can understand and take advantages by using ICT.

The collaboration with local government is become certainty to run the program. It will facilitate in communication hence the knowledge transfer will be more effectively. To collaborate with local government, we also need to open their mind about how important of the ICT is. Not all local governments are aware about ICT.

For effectiveness and sustainability, some aspects of the telecenter must be considered such as development of locally relevant contents; community-driven initiative, local private and local government involvement.

## **OBJECTIVE**

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The main objective of this activity is to reduce digital divide through empowering and sharing existing resources. This main objective are achieved through increasing opportunity the rural community to access global information easier and cheaper, hence rural economics can grow and job vacancies are more open.

## **METHODOLOGY**

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To achieve the objective the following are the steps: (1) study of economics aspect for telecenter sustainability (2) study best practice and best application for telecenter (3) establishing collaboration with local government and private sectors (3) educate the community (4) monitoring.

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## PROJECT IMPLEMENTATION & RESULTS

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### Designing Telecenter Prototype

The first activity in this program was collecting information about existing conditions. From the collected data, some of school's computer facilities in rural areas are still stand alone and have no connection to the internet. Creating a local area network is simple, but how to get access to the internet is the problem. The local area network was designed to have a server-client connection architecture. The server functions as a proxy and billing system. The proxy is needed to regulate users who will use the facility. The regulation is very important to avoid abuse of the connection. The telecenter is occupying the school which most of users are students, hence inappropriate applications and information are restricted. For economic reasons, we chose Linux for the operating system. There are so many Linux variants; we elaborated which one is valued the best for implementing in the Indonesian rural community. We are looking for the simplest one so the community can learn easily. Some of the Linux variants which we installed are Ubuntu, XUbuntu, Mandrake, Xandros, Mandriva, Fedora, Suse, Foxlinux, Redhat Advanced Server, Linux Trustix 2.0, etc, and finally we chose XUbuntu for the client operating system and Mandrake for the server.

To monitor the development of the program, we created a web blog at <http://linuxunil.blogspot.com>. From this web blog we report whatever has been done and other teams monitor what is the progress.

One of the purposes of establishing the telecenter is to increase economic growth in rural urban areas. Almost every region has its own special local products. Unfortunately the product is still become a domestic product caused by limited marketing. We realize if the internet is very effective marketing to announce whatever product we have. By this reason we also studied about how to make a simple website, so the community can create and maintain their website by themselves. For this purpose we studied some free Content Management System (CMS). Some CMS that are already tried are Mambo, Limbo, Jomla, and OsCommerce. We also studied some free CMS for academic purposes that are Atutor and Moodle. From the study we chose Mambo, Limbo, OsCommerce and Moodle to fulfill the community needs.

In the same time with designing a telecenter, we offer our idea to e-government community in Indonesia. Some local governments from some islands were contacted, and stated that they are

ready to become a pilot project. Based on some reason, finally we choose Kebumen as the partner. Head of Electronics Data Center in Kebumen has strength relationship with almost all head of school in Kebumen. Kebumen also has strong pretension to socialize the implementation of ICT to their community.

On purpose to simplify knowledge transfer, we create video tutorial how to install server and client using Linux. We also create some video tutorials for CMS such as how to install and manage Mambo, Limbo, Moodle and OsCommerce. Video tutorial is one of the way to disseminating knowledge to community, hence the community can continue distributing knowledge to other community.

Economics study was done in purpose to keep the sustainability of the program. In the economics study we made simple program using Microsoft Excel to calculate the investment and return for any specific conditions. By this simple software, any body which concern to establish a telecenter calculates how much the infestation are, and how much the price for every services which will be offer by a telecenter. The orientation of this economics study is not for business purpose, but more to keep sustainability from the operation of a telecenter.

The result from the economics study is simple cash flow software using Microsoft Excel which can be used by Telecenter Management to calculate business aspect to sustain the telecenter without assessing others.

### **Collaboration with others side**

To run the program, we made some collaboration with some private sectors and government. Some industries which involved in this program are PT. OzNet, Cisco Networking Academy Program Department of Electrical Engineering University of Indonesia. Kebumen government also holds some local IT industries such as Jogja Medianet, Sylcom Semarang, and PT. Telkom Kebumen Branch.

### **IT Literacy Workshop for Kebumen Society**

After preparing both technical and non-technical aspects, the workshop was held on August 28-31, 2006 at Sekolah Menengah Kejuruan Negeri 2 Kebumen. The workshop is opened by Head of Electronics Data Centre on behalf of Regent of Kebumen. Figure 1 show the situation for opening ceremony.

The workshop which held during four days was attended by 160 participants from many backgrounds such as lecturers, local government staff, teachers, student, librarian, staff of internet cafe, staff of hospital, and from private sector. The topics which conducted during the workshop are (1) set upping and managing of telecenter; (2) workshop on developing personal and commercial website; (3) workshop on wireless technology; (4) workshop on advanced computer networking and; (5) workshop on animation design. The last topic was based on Kebumen community request. In every workshop, we always deliver brief information about telecenter and the benefit for community. Figure 2 shows the situation when instructor discussed about telecenter.

Workshop was held with practical approach, every participant directly done whatever they learn. Figure 3 shows how participant get hands-on. Some tutorial in the form of Video CD was distributed to participant, so they can do whatever they learn on the other time.

The worskhop was fully supported by SMKN 2 Kebumen which offers their computer laboratory which consists of 30 computers. Caused by limited computer, some participants bring their own laptop to follow the workshop. Internet access was provided by PT. Telkom Kebumen Branch which gave 2 Mbps for free during the workshop. Figure 4 shows the situation in the class.

Some others local private sectors such as Jogyamedianet and Sylcom Semarang supporting gifts for participant which can answer the question.



**Fig 1.** Opening Ceremony



**Fig 2.** Explanation about Telecenter



**Fig 3.** Hand on Activity. Setup wireless access point for Wireless LAN



**Fig 4.** Situation in the class room.

### **Sustainability Communities**

To keep in touch with all participants, we share our email address and messenger identification. By this time communication is still running and some participant asked manythings about their problems.

### **Results of the Program**

The results of the program are as follow:

1. The readiness of some schools to become Telecenters
2. Network establishment with contact person for more than 50 representatives.
3. Network establishment with local private sector
4. Video tutorial for Ubuntu, Limbo, Mambo, OsCommerce, Moodle, and Server installation for Telecenter.
5. Simple Telecenter Cash flow application software

Eventhough there are some achievement, the telecenter it selves is still not established yet. By the end of the workshop, some of head of school state that their school will immediately be ready to become a telecenter.



**Arief Udhiarto** is a lecturer at Department of Electrical Engineering University of Indonesia in the field of Microelectronics. He received his master degree in Electrical Engineering from University of Indonesia in 2004. Although his field is in microelectronics technology, he also very concern in dissemination of information and communication technology to the community. That is why he joint to become Cisco Networking Academy Program Instructor to share his knowledge to the communities.